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PREFACE

BY THE

PRESIDENT OF THE CONGRESS.

In the Address which I delivered at the Opening of the Congress, I discussed the features and advantages of Congresses *in general*, and I now have the pleasure, in response to the invitation of the Editor of the Transactions, to prefix a few remarks upon the scope and value of the present Congress.

The Meeting occurred at a very interesting and instructive stage of Social development, manifesting its Spirit in every country in a uniformly definite direction, whatever might be the various particular modes of its expression. The phases of Social relations,—as a famous French Socialist, the precursor of Comte, indicated in the early part of this Century,—remarkably present a periodic, cyclical character, but a character ever involving progress notwithstanding the temporary or apparent retrogressions that may from period to period intervene. In one Era, the conditions of Existence,—or the Environment, to employ the modern comprehensive term,—are adequately, or approximately, consonant with the general Spirit of the Age, or Zeitgeist, and social equilibrium exists: a Critical epoch then ensues, with an interlude of divergence and incongruence between these two elements of associated life; the ancient order is discussed, modified, and reconstructed; and the Sequel appears when once more a harmony prevails between the general Feelings and Motives of the period and the revised and more exactly balanced conditions in which the enlarged Spirit now finds a higher expression. This latter stage,—the era of tentative social re-formation into which the Critical crisis has merged in recent years,—is prominently discernible in the organized efforts almost universally existent in connection with Old

Age Pensions, and with Compensation for Accidents to Workmen. Hence has arisen one of the striking characteristics of the present Congress, as shown in the able presentation and discussion of these subjects. I thus direct special attention, by this reference, to the essentially *Practical* and generally serviceable Nature of this Congress, and the hopeful capacity and spontaneous attempt of the Actuarial Profession in furnishing assistance to Statesmen and Economists towards the efficient solution of these problems. Originating necessarily in Feeling and in a Sense of Mutual Obligation, the working embodiments of these Sentiments require direction and technical counsel in the *forms* of their expression if they are to prove permanently stable; and it is here that the Papers and Discussions at the Congress display their appropriate value in the sphere both of Statistics and of professional advice.

In these questions, and in the important cognate subject of Friendly Societies, the Congress has performed another most valuable service, in my judgment, in presenting, so to speak, a combined Picture of the several modes in which the practical organisations for effecting these purposes have already been established in various countries. The essential function of science, both in Theory and Practice, consists in the collection and methodisation of suitable data; the interpretation of their teachings; and the formation, based upon such experience, of improved schemes of realisation. And although the period during which those forms of practical expression have been in operation is too brief to prove sufficiently indicative and adequately suggestive, still a considerable gain has been produced by the mere authoritative exposition of the different plans, and the comparisons and partial deductions which consequently can be drawn and examined. If on no other ground, the Congress is to be sincerely congratulated on having furnished the occasion of this collective presentation of facts as a basis of thought and of wise reconstruction.

A similar plan has been excellently pursued in the Statistical exhibition of State Legislation in many countries as affecting Assurance enterprise, and the discussions which occurred upon the principles and limits within which such Legislation should be restrained. I confidently contend that this subject has been placed in a clearer and steadier light, as a prelude to further attempted

development in this direction, by the agency of the Congress. Subjects more peculiarly appropriate to the technical work of the Actuary have also been soundly and helpfully treated; and I cannot conclude without referring to the unanimous assent of the Profession that a scheme of Universal Notation should be adopted. The spontaneous and gratifying manner in which this result was attained clearly revealed the fact that every mind had been naturally tending in the same direction as a teaching of experience and of widening communion. It was felt that not merely did a common symbolic language constitute one of the firmest bonds of adhesion in a Profession, but also, as in every other department of Research, that a systematized and consistent Notation formed one of the most potent instruments in the expansion of the Knowledge which it expressed and aided. The latent source of future difficulty in most organisations and reforms has resided in the rigid fixity of the Constitution or Rules originally adopted, but this hindrance has been wisely averted by the sequent decision of the Congress which, while establishing the fundamental and permanent elements of the Notation, has afforded scope for such extensions of the scheme as subsequent progress may suggest and demand.

International Congresses of Actuaries, by their auspicious commencement, and by the sustained activity and resourcefulness displayed on the present occasion, have fully justified their existence, and involve ample and hopeful promise of an ever-expanding usefulness to the Profession with which they are particularly associated; to the system of Assurance generally; and to the elucidation and practical resolution of Social and Economic problems.

I should do grave injustice to my feelings if I failed to mention, and gratefully to acknowledge on behalf of the Profession, the patient care, the exhaustive diligence, and the unwearied pains which the Editor of these Transactions has loyally and cheerfully expended in the preparation of the Volume.

T. E. YOUNG.

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PRELIMINARY STATEMENT.

THE First International Actuarial Congress, held at Brussels, unanimously resolved on 6 September 1895, that the Second International Actuarial Congress should be held in London in 1898.

In accordance with that resolution, the Council of the Institute of Actuaries invited the Congress to meet at Staple Inn Hall, Holborn, London, W.C., on May 16 to 20 1898, and appointed an Organizing Committee, with full powers, to make the necessary arrangements.

Early in 1897, through the *Journal of the Institute of Actuaries* (April 1897, vol. xxxiii, p. 280), and by correspondence with the Permanent Committee of International Actuarial Congresses in Brussels, and with the Actuarial centres in various countries, the preliminary regulations of the Congress were promulgated, as follows :—

It has been resolved that membership of the Congress shall be limited to

(1) Members of the Brussels Congress of 1895, and Members of the Permanent Committee of Actuarial Congresses.

(2) Fellows, Associates, and Corresponding Members of the Institute of Actuaries.

(3) Fellows of the Faculty of Actuaries in Scotland, and Members of that body of analogous rank to the Associates of the Institute.

(4) Members of Actuarial Institutions in the Colonies and Foreign Countries, of analogous rank to Fellows and Associates of the Institute of Actuaries.

(5) Actuaries and Assistant Actuaries of all Life Offices, and Government Actuaries and Statisticians, in the United Kingdom, the Colonies, and Foreign Countries.

(6) Members of the Council of the Royal Statistical Society.

While membership is to be restricted in accordance with the above rules, yet, that no one with a real claim to membership should be excluded, it has been arranged that the Organizing Committee will specially consider the application of any person, well recommended by one qualified under the rules to be a member.

The subscription for membership has been fixed at £1.

The Organizing Committee invite Colonial and Foreign Governments, and Actuarial Institutions in the Colonies and Foreign Countries, to nominate delegates, qualified under the rules, as their official representatives at the Congress. They also invite the contribution of papers, suitable to be read and discussed at the Congress, such papers to be sent to the Honorary Secretaries of the Institute of Actuaries not later than the end of February 1898.

The official language of the Congress will be English, but papers may be written in French or German. So far as possible, papers should be type-written.

By a circular issued early in 1898, the following further regulations as regards subscriptions were laid down, namely:

The subscription for membership is £1, and the equivalent rate for foreign countries is as follows—

Countries in the Latin Union	25 francs.
America	5 dollars.
Austria-Hungary	12 florins.
Denmark, Norway, and Sweden ...	18 kroner.
Germany...	20 marks.
Holland	12 florins.
Russia	10 roubles.

The following gentlemen are authorized to receive subscriptions and to give official receipts which will secure admission to the meetings:

America ...	Mr. John Tatlock, Jr., 32 Nassau Street, New York.
Australia ...	Mr. Richd. Teece, 87, Pitt Street, Sydney.

Austria-Hungary	Mr. J. Altenburger, Trieste.
Belgium ...	Mr. L. Duboisdenghien, 48, Rue du Fossé aux Loups, Brussels.
Denmark ...	Mr. N. Thiele, Copenhagen.
France	Mr. Léon Marie, 32, Rue Jouffroy, Paris.
Germany ...	Dr. Grosse, Goltzstrasse 28 III, Berlin, W.
Great Britain ...	Mr. H. W. Manly (Treasurer), Mansion House Street, London, E.C.
	Mr. Thos. Wallace, 64, Princes Street, Edinburgh.
Holland ...	Mr. C. Paraira, 117, Sarphatiestraat, Amsterdam.
Italy	Mr. G. Toja, Florence.
Japan	Mr. E. Yano, Tokio.
New Zealand ...	Mr. J. H. Richardson, Wellington.
Norway... ...	Mr. O. Schöll, Christiania.
Russia	Mr. S. de Savitch, St. Petersburg.
	Mr. R. Penl, Gr. Morskaja 37, St. Petersburg.
South Africa ...	Mr. James McGowan, Cape Town.
Spain & Portugal	Dr. José Maluquer y Salvador, 10, Campomanes, Madrid.
Sweden... ...	Mr. A. Lindstedt, Stockholm.
Switzerland ...	Mr. H. de Cérenville, Lausanne.

After correspondence with the Permanent Committee in Brussels, and with the centres in the various countries, the following five principal questions, on which papers were invited, were set down for discussion, namely—

(1) Old Age Pensions.

(2) Legislation in relation to Life Assurance, namely—the general principles of the laws which regulate Life Assurance contracts, and the constitution of Assurance Companies.

(3) The position of Friendly Societies in various countries.

(4) Compensation to Workmen for Accidents, with special reference to the Actuarial and Financial principles, and to existing laws.

(5) The Question of a Universal Actuarial Notation.

It was also intimated that papers on other suitable subjects would be received.

In accordance with the foregoing arrangements, the Congress met at Staple Inn Hall, Holborn, London, W.C., on Monday, May 16 1898, and the four following days. The Organizing Committee had settled the Agenda as follows—

Monday, May 16.

(1) Election of President.

(2) Election of Vice-Presidents and Secretaries.

(3) Inaugural Address by the President.

(4) Discussion of Papers submitted on miscellaneous subjects.

Tuesday, May 17.

Discussion of Papers submitted on the question of Legislation in relation to Life Assurance.

Wednesday, May 18.

Discussion of Papers submitted on the Position of Friendly Societies in various countries.

Thursday, May 19th.

(1) Discussion of the question of Universal Actuarial Notation.

(2) Consideration of a proposal by Mons. A. Quiquet for an International Actuarial Dictionary.

(3) Discussion of Papers submitted on the question of Compensation to Workmen for Accidents.

Friday, May 20.

(1) Discussion of Papers submitted on the question of Old Age Pensions.

(2) To fix the year and place of the next Congress.

(3) General business.

(4) Votes of thanks.

In the following pages will be found the Minutes of the Congress; and the Transactions containing the full text of all the Papers submitted, with their English translations. In the case of the miscellaneous Papers taken on Monday, May 16, an abstract of the discussion follows each Paper; while in the case of the Papers taken on the other days, all the Papers on each individual subject, with their translations, are given consecutively, and an abstract of the discussion then follows.

SECOND INTERNATIONAL ACTUARIAL CONGRESS.

MINUTES OF PROCEEDINGS.

MONDAY, MAY 16, 1898.

The Congress assembled at 10.30 a.m.

In his capacity of President of the Permanent Committee of International Actuarial Congresses, Mons. O. Lepreux took the chair, declared the Congress open, and proposed that Mr. Thomas Emley Young, B.A., President of the Institute of Actuaries, be elected President.

Mr. Emory McClintock seconded the motion, which was carried by acclamation.

Mr. Young, the new President, took the chair.

The President said that, in accordance with precedent, the first business of the Congress was to elect Vice-Presidents and Secretaries for the various countries. It would be for the members present from each country to select a Vice-President and a Secretary, whose names would then be submitted to the Congress for election. It had been arranged that, on account of the work of the Congress, Great Britain should have two Vice-Presidents and two Secretaries; and also that, for the purpose of such representation, Denmark, Norway, and Sweden should be grouped, as also Germany with Austria-Hungary, Italy with Switzerland, and Canada with the United States of America.

After a brief interval for consultation, the following gentlemen were proposed, seconded, and unanimously elected, and they took their seats round the table on the platform—

Country.	Vice-President.	Secretary.
Belgium	A. Bégault.	L. Duboisdenghien.
Denmark, *Norway*, *Sweden*	Dr. T. N. Thiele	Dr. T. N. Thiele.
France	Léon Marie	A. Quiquet.
Germany, *Austria-Hungary*	Dr. Gerkrath	Dr. Grosse.
Great Britain	David Deuchar	A. F. Burridge.
	Henry W. Manly	F. B. Wyatt.
Holland	Dr. Paraira	Dr. R. H. Van Dorsten.
Italy, *Switzerland*	B. G. Sestilli	Dr. G. Schaertlin.
Russia	Professor S. de Savitch	J. Lefteiew.
Canada, *United States.*	E. McClintock	I. C. Pierson.

The President delivered his inaugural address, given in full in the Transactions.

Mons. O. Lepreux asked leave to say that he was requested by Mons. Paul de Smet de Naeyer, Finance Minister of Belgium, and Honorary Vice-President of the Congress, to express regret that his official duties prevented him from being present in person; but that he sent his very best wishes, and had no doubt that the discussions on the various important subjects entered on the Agenda would bear valuable fruit.

In the absence of the author, through illness, a Paper on Graduation, by Dr. Karup, was taken as read.

Mons. Corneille Landré submitted, with a few remarks, a Paper on the Limits to be held by Life Assurance Offices, and Mr. George King spoke on the subject.

Mr. de Savitch submitted a Paper on the Calculation of Surrender Values.

In the absence of the author, a Paper by Mr. McLauchlan, entitled Note on the Mortality in the British Navy and Army, was taken as read.

In the absence of the author, Mr. George King submitted a Paper by Mr. David Carment on the Rates of Mortality in Australia and New Zealand, and expressed the regret felt by all that, owing to the great distance, none of the Australasian Actuaries, who had sent several valuable contributions to the Transactions, had been able to attend.

Mons. Fl. Hankar, in a speech reported in the Transactions, introduced a Paper on Life Assurance by the Caisse Générale d'Epargne et de Retraite of Belgium, on which a discussion took place, Mons. A. Bégault and Dr. Gerkrath taking part.

Mr. Walter S. Nichols submitted a Paper on Limitations of the System of Net Valuations, and in the discussion which followed, Messrs. Philip L. Newman, Emory McClintock, and George King took part.

In the absence, through illness, of Mr. E. W. Scott, his Paper on the Influence on the Prosperity of Life Offices, of Valuations taking account of Expenses of Management, was taken as read.

The Congress adjourned.

In the evening the Congress was received at the Mansion House by the Right Hon. the Lord Mayor of London and the Lady Mayoress.

Tuesday, May 17, 1898.

The Congress re-assembled at 10.30 a.m., Mr. Young, the President, in the chair.

The President, in opening the proceedings, explained that, as all the Papers for the day were on the subject of Life Assurance Legislation, they would be taken consecutively, each author, or in his absence his representative, introducing the Paper with a few remarks in the form of a brief abstract. When all the Papers had thus been submitted, a general discussion would follow, and speakers would be at liberty to discuss either one particular Paper or the subject generally.

The following Papers were then taken—

(*a*) On Life Assurance Legislation in Australasia. By Richard Teece. In the absence of the author, submitted by Mr. G. King.

(*b*) On State Life Insurance Legislation in New Zealand. By J. H. Richardson. In the absence of the author, submitted by Mr. G. King.

(*c*) Summary of the Law with respect to Life Insurance in New Zealand, outside that regulating the Government Insurance Department. By J. H. Richardson. In the absence of the author, submitted by Mr. G. King.

(*d*) Legislation affecting Life Assurance Contracts, and Life Assurance Companies, in Cape Colony. By James McGowan. In the absence of the author, submitted by Mr. G. King.

(*e*) On various Laws relating to the Life Assurance Contract from the International point of view. By H. Adan. In the absence of the author, submitted by Mons. O. Lepreux.

(*f*) On Life Assurance Legislation in France. By L. Massé. Submitted by the author.

(*g*) On Insurance Legislation in the German Empire, 1895-1897. By Dr. Karl Samwer. In the absence of the author, submitted by Dr. Gerkrath.

At this point the President vacated the chair, which was taken by Mr. Manly, Vice-President.

(*h*) On Life Assurance Legislation in Holland. By J. F. L. Blankenberg. Submitted by the author.

(*i*) On Life Assurance Legislation in Russia. By M. Ostrogradsky. In the absence of the author, submitted by Prof. S. de Savitch.

(*j*) On Commercial Legislation relating to Life Assurance in Spain. By J. Maluquer y Salvador. In the absence of the author, taken as read.

(*k*) On Legislation relating to Life Assurance in Switzerland. By Dr. Ceresole. Submitted by the author.

(*l*) On Legislation in its Commercial and Economic bearing on Life Assurance, from the National and the International points of view. By Charles Le Jeune. In the absence of the author, submitted by Mons. A. Bégault.

(*m*) On Legislation as affecting the Life Assurance Contract in the United Kingdom. By Arthur R. Barrand. Submitted by the author.

In the discussion, the following speakers took part, namely, Messrs. Manly, Léon Marie, T. B. Sprague, Arthur Fontaine, George King, A. H. Bailey, William D. Whiting, and Emory McClintock.

The Congress adjourned.

After the meeting, the Congress was entertained at luncheon by the Directors of the Prudential Assurance Company.

WEDNESDAY, MAY 18, 1898.

The Congress re-assembled at 10.30 a.m., Mr. Young, the President, in the chair.

The President opened the proceedings with a few remarks reported in the Transactions.

The following Papers were then taken—

(*a*) On Friendly Societies in Belgium. By L. Duboisdenghien. Submitted by the author.

(*b*) On Friendly Societies in France. By Jules Cohen. Submitted by the author.

(*c*) On the Development and Operation of Workmen's Assurance in Germany. (A. General Considerations, and B. Sickness Assurance.) By Heinrich Unger. In the absence of the author, submitted by Dr. Grosse.

(*d*) On Friendly Societies in Holland. By J. van Schevichaven. In the absence of the author, submitted by Dr. S. R. J. van Schevichaven.

(*e*) On Friendly Societies in Spain. By J. Maluquer y Salvador. In the absence of the author, taken as read.

(*f*) On the Legal Organization of Friendly Societies in the United Kingdom. By E. W. Brabrook, C.B. Submitted by the author.

(*g*) On the relation which should exist between the State and Non-Collecting Friendly Societies. By Philip L. Newman. Submitted by the author.

(*h*) On Friendly Societies in Cape Colony. By James McGowan. In the absence of the author, taken as read.

(*i*) On Friendly Societies in New Zealand. By George Leslie. In the absence of the author, taken as read.

In the discussion, the following speakers took part, namely, the President, and Messrs. Christian Moser, O. Lepreux, Marcus N. Adler, Francis G. P. Neison, Léon Marie, and Reuben Watson.

The President gave notice that a meeting of the Executive Council of the Permanent Committee of Actuarial Congresses would be held after the session of the Congress on the following day.

The Congress adjourned.

In the evening, the foreign Members of the Congress, and the Official Delegates, were entertained at dinner, at the "Star and Garter" Hotel, Richmond, by the Institute of Actuaries' Club.

THURSDAY, MAY 19, 1898.

The Congress re-assembled at 10.30 a.m., Mr. Young, the President, in the chair.

Before passing to the business of the day,

The President said that it had been suggested by their foreign friends, and in their sentiment the British members most heartily concurred, that under the great shadow and sorrow under which they sat in respect of the news in the morning's papers of the death of William Ewart Gladstone, some tribute should be paid of sympathy and condolence. On a solemn occasion like the present, all differences of opinion, whether political or administrative, absolutely subsided, and they simply remembered the high-minded statesman, the intrepid administrator, the consummate financier, and the friend and champion of popular liberty throughout the world.

M. Lepreux said the sad news has spread over London and over all England—Mr. Gladstone, the Grand Old Man, of whom his country is so proud, is dead. We abroad know what profound admiration, what merited acknowledgment the English people have devoted to the great statesman whose career has been the glory of the political history of England. But men like Mr. Gladstone do not belong to their own country alone. No one, I think, as a defender of liberty and of progress, has a better title to be called a citizen of the world. His death, therefore, concerns not only England: it affects the whole world. I ask to be allowed, in the name of the foreign delegates, to share in the mourning of the English people to-day.

The President then said they therefore in silence and with respect expressed their deep sense of sorrow and sympathy with this national and, indeed, universal bereavement.

The following Papers were taken:

On Universal Actuarial Notation. By Am. Bégault. Submitted by the author.

On Universal Actuarial Notation. By George King. Submitted by the author.

After summarizing his Paper, Mr. King moved the following three resolutions:—

(1) That the Notation of the Institute of Actuaries shall be employed in preference by the actuaries of all countries.

(2) That such expansions and improvements thereof as the continually extending sphere of actuarial science may render desirable, shall be considered at future Congresses.

(3) That such Notation, as now approved, be printed in the Transactions of the Congress.

Mons. L. Marie, in a speech reported in full in the Transactions, seconded the resolutions.

In the discussion which followed the following speakers took part, namely:—Dr. T. B. Sprague, Mr. C. D. Higham, Dr. Christian Moser, Mr. Israel C. Pierson, and the President.

On being put from the chair, the three resolutions of Mr. King were carried unanimously.

The following were appointed as a Committee to arrange a schedule of the Notation for the Transactions of the Congress, namely:—M. Bégault, Dr. Karup, Mr. King, M. Marie, and Dr. Sprague.

The Notation thus adopted being practically limited to Life Assurance and Annuity transactions, it was moved by Dr. Christian Moser, seconded by Mr. George King, and carried unanimously, that a Universal Notation be adopted, not only for life assurance, but for all other branches of assurance; and that the matter be referred to the Permanent Committee for consideration and report to the next International Actuarial Congress.

The President vacated the chair, which was taken by Mr. Manly, Vice-President.

The following Paper was taken:—

On International Actuarial Dictionaries. By A. Quiquet. Submitted by the author.

The following speakers took part in the discussion, namely:—

The Chairman (Mr. Manly), MM. L. Marie, and O. Lepreux, Dr. G. Schaertlin.

The two following resolutions were proposed by M. Quiquet, and carried unanimously, namely—

(1) That it is desirable that an International Dictionary of actuarial and commercial terms be prepared, printed, and published, as soon as possible.

(2) That it be referred to the Executive Council of the Permanent Committee to give effect to this resolution.

In view of the increasing duties being imposed on the Permanent Committee of International Actuarial Congresses, M. L. Marie proposed, that the Second International Actuarial Congress, assembled in London, makes a pressing appeal to the Actuaries of all countries, and urges them to join the Permanent Committee of International Actuarial Congresses, so as to strengthen that Committee from the double point of view,—the intellectual and the financial—and to unite the Actuaries of the whole world for the development of actuarial science.

The resolution, on being put from the chair, was carried unanimously.

The following Papers were taken :—

(*a*) On Compensation for Workmen's Accidents in Belgium, by L. Maingie. In the absence of the author, submitted by Mons. A Bégault.

(*b*) On the Present Position of the question of Workmen's Accidents in France. By L. Weber. Submitted by the author.

(*c*) On the Development and Operation of Workmen's Assurance in Germany. (C. Accident Assurance). By H. Unger. In the absence of the author, submitted by Dr. Grosse.

(*d*) On Workmen's Accidents in Spain. By J. Maluquer y Salvador. In the absence of the author, taken as read.

(*e*) On the Law relating to Workmen's Accidents in the United Kingdom. By S. Stanley Brown. Submitted by the author.

(*f*) On the Position of Workmen in Cape Colony in regard to Legal Compensation for Injuries. By James McGowan. In the absence of the author, taken as read.

(*g*) On Compensation to Workmen for Accidents in Russia. By A. Pokotiloff. Submitted by the author.

(*h*) On Workmen's Assurance against Accidents in Austria. By Karl Kögler. Submitted by the author.

(*i*) On the Question of Workmen's Accidents in Italy. By Gioberti Luzzati. In the absence of the author, submitted by r. Sestilli.

(*j*) On the Belgian Bill on Compensation for Injury caused by Labour Accidents. By O. Lepreux. Submitted by the author.

The following speakers took part in the discussion, namely, the Chairman and Dr. Schaertlin.

The Chairman announced that the meeting of the Executive Council of the Permanent Committtee of International Actuarial Congresses which had been called for that day (Thursday) had been unavoidably postponed until the next day (Friday), when it would be held at 9.30 a.m., before the session of the Congress.

The Congress adjourned.

In the evening, the Congress was received by the President and Council of the Institute of Actuaries, at the Galleries of the Royal Institute of Painters in Water Colours, Piccadilly.

FRIDAY, MAY 20, 1898.

The Congress re-assembled at 10.30 a.m. Mr. Young, the President, in the chair.

The following Papers were taken—

(*a*) On Old Age Pensions in Belgium. By O. Lepreux. Submitted by the author.

(*b*) On Old Age Pensions in France. By H. Duplaix. Submitted by the author.

(*c*) On the Development and Operation of Workmen's Assurance in Germany (D. Infirmity and Old Age Assurance). By H. Unger. In the absence of the author, submitted by Dr. Grosse.

(*d*) On Old Age Pensions in Russia. By S. de Savitch. Submitted by the author.

(*e*) On Old Age Pensions in Spain. By J. Maluquer y Salvador. In the absence of the author, taken as read.

(*f*) On the Proposed Law for the Establishment of a National Provident Fund for the Old Age and Infirmity of Workmen in Italy. By Dr. O. Sestilli. Submitted by the author.

(*g*) On the Existing System of Civil and Military State Pensions, in Italy, and on the tendencies towards Radical Reform. By F. Rainaldi. In the absence of the author, submitted by Dr. Sestilli.

(*h*) On the Present Condition of Railway Pension Funds in Italy, and the tendencies which appear to prevail. By F. Benedetti. In the absence of the author, submitted by Dr. Sestilli.

(*i*) On the Solution of Problems which frequently arise out of the Rules of Pension Funds and Friendly Societies. By H. W. Manly. Submitted by the author.

In the discussion, the following speakers took part, namely, the President, MM. G. Patel, L. Weber, Sestilli, Landré, Pokotiloff, Marie, and Schaertlin.

GENERAL BUSINESS.

Third International Actuarial Congress.

M. Léon Marie (France), on behalf of the Institute of French Actuaries, in inviting the Congress to Paris, moved that the Third International Congress meet in Paris in the year 1900.

M. Bégault (Belgium), seconded the motion, which was carried with acclamation.

Mr. E. McClintock (America), on behalf of the Actuarial Society of America, expressed the hope that the Fourth International Actuarial Congress might meet in New York in 1903.

Permanent Committee.—Alteration of Regulations.

The President moved, and M. Bégault seconded, and it was carried unanimously, to add a clause to Article 5, empowering the Executive Council to co-opt Temporary Consultative Members.

The President moved, and M. Bégault seconded, and it was carried unanimously, to amend Clause 6, so that the Bureau may have power to convene meetings of the Executive Council in towns other than Brussels.

The full text of these amendments of the Regulations is given in the Transactions.

Votes of Thanks.

On the motion of the President, a vote of thanks was unanimously passed to the Honorary Vice-Presidents.

On the motion of the President, a vote of thanks was unanimously passed to the Contributors of Papers.

On the motion of the President, a vote of thanks was unanimously passed to the Vice-Presidents.

On the motion of Mr. W. D. Whiting (America), a vote of thanks was unanimously passed to the President and Officers.

On the motion of Mr. Pokotiloff (Russia), a vote of thanks was passed to the Organizing Committee of the Congress, and to the Executive Council of the Permanent Committee of International Actuarial Congresses.

The President thanked the Congress for these two votes.

The Proceedings of the Congress then closed.

In the evening the Institute of Actuaries held its Jubilee Dinner at the Holborn Restaurant, to which the Foreign members of the Congress were invited.

Mr. T. E. Young, President of the Institute of Actuaries, and of the Congress, occupied the chair.

After the toast of the Queen, the Chairman gave the toast of the Institute of Actuaries, which was responded to by Mr. H. W. Manly, President Elect of the Institute.

Mr. George King gave the toast of International Actuarial Congresses, which was responded to by Messrs. O. Lepreux and S. de Savitch.

Mr. D. Deuchar, President of the Faculty of Actuaries in Scotland, gave the toast of The Guests, which was responded to by the Right Hon. Leonard H. Courtney, M.P., Dr. Grosse, and Dr. S. R. J. Van Schevichaven.

M. Léon Marie gave the toast of The President, to which the President responded.

The singing of Auld Lang Syne brought the proceedings to a close.

The speeches at the dinner are given in the Transactions of the Congress.

SATURDAY, MAY 21, 1898.

The Foreign Members of the Congress were invited to an excursion to visit Windsor Castle, and to lunch at the White Hart Hotel, Windsor.

TRANSACTIONS.

SECOND INTERNATIONAL ACTUARIAL CONGRESS.

TRANSACTIONS.

INAUGURAL ADDRESS

DELIVERED BY

T. E. YOUNG, B.A., F.R.A.S.,

President of the Congress, President of the Institute of Actuaries.

My primary duty, gentlemen, which I unaffectedly fulfil, is to express my sincere acknowledgments of the happy fortune which you have assigned to me in the memorable honour of presiding over the deliberations of the Congress.

My higher and very grateful privilege is to convey to you a most cordial welcome, in the name of the Institute of Actuaries, to what I may, with admitted fitness, describe as the ancestral home of Actuarial Science. And in uttering this message of genuine greeting, I beg leave to assure you that we regard you in no sense as visitors or strangers, but as personal friends and brethren. We feel stimulated by your presence; we shall follow your counsels with an interest and profit deepened and enriched by the spell of intimate intercourse; and it requires no prophetic insight to predict that, by this fraternal communion of intellect and feeling, we shall consolidate into more enduring unity the Corporate power and influence of our common Profession whose fortunes, in amicable emulation, we all proudly and loyally cherish.

But it is a troubled incident of our humanity that on most festal occasions rests the shadow of loss, and of regretful memories: and, in this auspicious moment, we mourn the absence of M. Léon Mahillon, whose inspiring and enthusiastic spirit formed so potent an element in the propitious inauguration of these Assemblies. Still we rejoice in the legacy of earnest purpose which he bequeathed, and we shall worthily commemorate our remembrance of his work, and of the co-operation of others of whose anticipated presence Death has bereft us, by maintaining in the continuous record of our Congress that distinctive tone and those useful ambitions which they exhibited and diffused at its birth.

In an Address of this general character, it may not fail in interest if, prior to touching upon the specific ends on which our hopes are bent, I advert, without wearying you with pedantic details, to the origin of Congresses, and to the social and industrial influences under whose expanding impulse and sway their main or settled design has gradually broadened into larger limits and remoter, though still connected, aims.

The term, Congress, itself affords a curious illustration of that incessant oscillation of import and extent which renders the biography of words, regarded as the symbols and symptoms of social movements and varying conditions, of so fascinating and perennial an interest in the interpretation of human progress. Like the recurrent rhythm of social processes, which St. Simon so strikingly generalized, words become widened from specialized into general meanings, and again restrict their boundaries of connotation and lapse into a narrower sphere. Though the enquiry, from the fugitive nature of the subject, is obviously fragmentary, for Words, as Horne Tooke reminded us, possess the gift of Wings, it would yet appear that originally, in the English usage, as shown in the literary custom of the 16th century, the title of Congress was descriptive of an ordinary meeting of persons, and expanded, in the 17th century, into the meaning of a combination or coalescence of material objects; varied by an application to gatherings where union was supplanted by contention; until, ultimately, it appears to have acquired a technical form as more precisely restricted to the assemblages of Sovereigns or accredited Plenipotentiaries for the purpose of securing a general or partial peace, and arranging, by conciliatory deliberations, on supreme occasions, the conflicting interests of National Powers. And I believe that the diplomatic usage is now confined, as distinguished from a Conference, to formal meetings of State Officials of the highest rank for conclusion of a general Peace. In an old historical work the term is employed in describing the settlement of the Constitutions of Clarendon between Henry the 2nd, the Council of the Nobility, and the Prelates, for the provision of Ecclesiastical order; and in a wider, though cognate, sense, it was applied to one of the earliest Congresses, convened in 1636 at Cologne, during the course of the Thirty Years' War, whose express intention was the completion of pacific negociations of an International character. With one minor deviation of use, therefore, which has since become obsolete, the title has been symbolical of attempted unity and concerted action; and this auspicious significance the term has preserved during the course of its successive and subsequent applications.

Passing from this verbal record, I would point out that the transmutation of that type of society which has been designated the Militant into the social form which has been described as the Industrial furnishes an essential condition of the successful expansion of these assemblages into the peaceful domains of Commerce, of Literature, of Art, of Science, and generally into the spheres of Intellectual and Industrial enterprise.

The predominant feature of the Militant type of life is obviously, *ex rei necessitate*, one of mutual repulsion; racial distinctions and geographical divisions prescribe concurrently the limits of National and local interchange; sympathy languishes within its restricted

bounds and tends to reach that maximum of purely self-regarding character which is barely consistent with associated life; mutual co-operation of any diffused compass is "crib'd, cabin'd, and confin'd" by the prevailing tone of compulsion; and the development of any section of the civilized world is conceived to be mainly dependent upon the decadence or ruin of adjacent communities; so that the spirit of a generous Scientific or Intellectual Commonwealth, if ever momently entertained, assumed the visionary shape of a hopeless and helpless dream. And as National Character is simply the complex union of the individual natures which constitute the mass,—both the National and individual form incessantly acting and reacting with reciprocal impress,—this aggressive temperament pervaded every avenue of life. Even the physical philosophers, "Masters of those who know", who, to employ Tennyson's phrase, might fitly be imagined to

> " . . . . haunt
> "The lucid interspace of world and world,
> "Where never creeps a cloud or moves a wind,"

strove, in numerous instances, to conceal their scientific discoveries even from the compeers of their Native land; retaining personally the intellectual possessions which appertained justly to the liberal service of mankind; while into the rivalries of Nations themselves never intruded even the dimmest conception of an emulous energy in a common cause which might transcend the arbitrary distinctions of Race and Clime.

In the vast survey of the Intellectual Kingdom, which Lord Bacon delineated in the *De Augmentis Scientiarum*, he especially lamented this pronounced deficiency of local and international sympathy as a grave impediment to the progress of knowledge; and prophetically and solemnly expressed the hope, appealing in his earnestness to a Divine standard, that there might dawn, to quote his own language, "a fraternity in learning and illumination." This aspiration only found its adequate fulfilment when the repellant Militant type of Society, with its stained and faded splendours, gradually vanished and became transfigured into the Industrial type which sought its ideal incarnation in voluntary connected labour and mutual inspiration whose unifying purpose should efface the infertility and meagreness of isolated, and especially discordant, toil.

And limiting our consideration to that element which is more germane to our professional studies, it has been noted, in glowing eulogy, by the Historians of Intellectual Progress,—particularly by Buckle in his *History of Civilization*, and by Lecky in his *History of the Rise and Influence of Rationalism in Europe*,—that a supreme agent in this emerging quest for unity, this transition from the exclusiveness of the one type to the inclusiveness of its successor, consisted of the fusing force of the enlightened doctrines of a systematic Political Economy, with their propagation throughout the world by cautious yet enthusiastic enquirers and interpreters. For, although, as Buckle and Bagehot have pointed out, the doctrine of Political Economy, by reason of the profound intricacy it presented were the complete desires, emotions, and aims of the human factor included, required, with a view to scientific simplification, to be denuded of a portion of

the premisses,—so that the human element involved assumed a partially imaginative form, and the purposes discussed appeared to possess an essentially selfish character,—still, its influence and effects, when developed into practice, were demonstratively perceived to tend, with clearer and ever progressive efficacy, to social consolidation and interdependence. The Industrial type of Society, thus animated and guided, beneficently matured; softening the harsh and distrustful features of social life until they graciously became transformed into the propitious aspect of confirmed intercourse, of which this Congress is, in our sphere, the symbolic expression.

The profound truth of Social Psychology, if I may employ the phrase, brought prominently into recognition by Mr. Herbert Spencer, thus gradually regained dominion over the thoughts of men, and directed and stimulated these widening hopes,—the doctrine, I mean, that the originative source of human effort in all provinces of mental, moral, and social activity, and particularly in its incorporated form, resides not, to employ philosophical language, in a cognition of the Understanding but in an emotion of the Heart. Hence, under these regenerated conditions and impulses, Feeling acquired its legitimate and controlling sway, and this generous spontaneity of union, like a freed and freshened current long pent up, swept, and will sweep, with invigorating pulses, into every natural channel of universal life.

Congresses have since united into helpful federation the various departments of Economic, Social, Literary, and Intellectual Interests; they may be aptly regarded as the larger social and widely-sympathetic side of collective mental and technical activity; and the name, consequently, in response to this exalted social conception, has reverted to its ancient significance of an assembly of Persons or of Bodies for corporate and reciprocal stimulus and aid.

Knowledge has become rightly regarded as a Universal Fund of Intellectual riches; restricted by no territorial boundaries; guarded and circumscribed by no exclusive possession; to which each worker accepts the trust of adding his individual acquisitions; from which each worker is entitled to abstract that portion of wealth which shall, in his patient and industrious hands, earn an intellectual accretion which again is deposited in the Common store.

And I may be permitted, as a student of Social History, to affirm that the scheme of Congresses displays the valid credentials of a natural and integral factor of human development, since they exemplify that Method of Evolution which is discernible in all organic, mental, and moral progress. To employ the terms of Mr. Herbert Spencer, they illustrate the dominant principle of ultimate Reintegration which is sequent to those ramified subdivisions which the increasing complexity of knowledge produces in the original and simpler constitution of associated work. The Actuarial Profession has thus impressively presented its claim to permanency in the scale of the Intellectual and Professional Order by the spontaneous and continuous character of its evolvement. It exhibits the authentic marks of a progressive organism, where, to apply the precise language of Kant, every portion is reciprocally and simultaneously a Means and an End towards accomplishment of the total functions it is established to exercise. Part is not merely correlated, in the general mechanism, to Part; Function not simply exists in essential codependence with

Function; but a Congress, to pursue the deep analogy, affords the crowning and consummate sign of complete organic efficiency through the sympathetic interplay of the diverse, yet unified, sections, on a massive scale.

Adverting to the influences inherent in Congresses, we note that, besides animating and concentrating the work and investigations of the individual Professional Bodies involved, the genius which they embody is essentially that general Spirit which constitutes the most potent element in compacting the Nations themselves into a comity of thought and sentiment,—the expression of Civilization in its genuine form,—while happily preserving those distinctive local characteristics which produce the harmony of life.

Regarding now the functions of a Congress from our specialized point of view, we discover the conjoint advantage of Professional and Personal service. We confer a systematic unity upon our Professional investigations by adoption of a uniform scheme of symbolic language; we thus become the possessors and inheritors of a common and intelligible tongue, undistracted by local dialects; diversified Babel, in the ancient allegory, is re-converted into primitive speech; with this bond we more closely, though diversely scattered, re-unite into a universal Scientific citizenship; the refined and competent finish of our analytical language re-acts, as has so significantly occurred in the history of Mathematics, upon the subtle and potential possibilities of research; we thus promote the cultivation of general established Methods by the co-operant aid of trained Intellects; narrower spheres and purposes of work enlarge their range and precision, through the clarifying influence of discussion; our several contributions not merely furnish an imposing mass of discriminated and organized data as the bases of subsequent serviceable deduction, but stimulate also, through varieties of view and helpful suggestiveness, the productive application of our Scientific Principles to wider and more fruitful enquiry; the Profession, —juncta juvant,—acquires a compacted organization of vitality and aptitude, impressing upon it not simply the conspicuous force of an organic Scientific Body but investing it also with authoritative weight as a Source of Reference in the world's regard; while, superior almost to all these ancillary agencies, this personal contact of mind with mind, and emulous thought with thought, linked together by pleasant interludes of social enjoyment, render our several labours more definite, vivid, and conclusive, where rivalry, in the impassioned language of Burke, "loses half its evil by losing all its grossness", and toil itself is enriched with the charm and memory of intimate fellowship.

In the daring but practical dream of the New Atlantis, the corporation of Mercatores Luminis amassed in the Central College the results of science and the opulence of thought which they had garnered from explorations in foreign lands; the Actuary, in his Congresses, has converted this quest from an exclusive into a sympathetic form, since our Intellectual Merchants of Light congregate from all countries for promotion simply of universal, unstinted, and indiscriminative gain.

And concentrating our vision upon the future, it will be abundantly evident, surveying the impressive range and diversity of the subjects to be submitted to the Congress, how baseless is the fancy that would assign a limit to the direction and utility of our

common work. These contributions conclusively prove that our compass of power is in no degree exhausted or restrained within the confined region of purely Actuarial interests; that on the contrary our Principles and Methods which, through a prolonged and eventful history, have become finely-fashioned and perfected, possess a ready pliancy and competency of application which attest a distinctive capacity of service in the domain of the Economist, the Statesman, and the Social Reformer. It is precisely a Congress which presents in one massive, condensed, and conspicuously intelligible form, the capabilities of our Professional life, and reveals the rich and copious heritage which the strenuous labours of our predecessors and of yourselves will bequeath to those successors whose felicitous fortune it will be to grasp and elevate the torch of Knowledge into regions of enquiry not yet adequately explored.

In now formally announcing the commencement of the Congress, I indulge with you in the fervent trust and assured confidence that our deliberations will effectively promote the consolidation of the Profession throughout the world; will combine the workers, wherever toiling, into the energy and hopefulness of a Scientific and Practical Commonwealth; so that more and more the Actuary may furnish an indefeasible title to utterance of that proud boast of Æneas, as he perceived the labours of Trojans pictured upon an alien shrine—

Quæ Regio in terris nostri non plena laboris.

Traduction.

Discours inaugural de T. E. Young, B.A., F.R.A.S., *Président du Congrès, Président de l'Institute of Actuaries.*

Mon premier devoir, Messieurs, devoir que je remplirai très simplement, c'est de vous exprimer ma reconnaissance sincère pour le plaisir que j'éprouve d'avoir été chargé par vous de présider aux délibérations du Congrès.

C'est pour moi un privilège plus grand encore, de pouvoir, au nom de l'Institut des Actuaires, vous souhaiter cordialement la bienvenue dans ce que je puis à juste titre nommer la demeure ancestrale de la science de l'Actuariat. Permettez-moi d'ajouter à ces paroles d'accueil, l'assurance que nous ne vous considérons pas comme des visiteurs, des étrangers, mais comme des amis, des frères. Nous sommes stimulés par votre présence; nous suivrons vos conseils avec un intérêt et un profit qu'accroîtront encore nos entretiens intimes; et il ne faut pas être prophète pour prédire que, par cette communion fraternelle d'intelligence et de sentiment, nous consoliderons davantage le pouvoir corporatif et l'influence de notre profession commune que tous, dans une amicale émulation, nous chérissons fièrement et loyalement.

Mais, et c'est là un des tristes côtés de la vie humaine, la joie de presque toutes les fêtes est obscurcie par l'ombre de quelque douloureux souvenir; aussi, à ce moment heureux, pleurons-nous l'absence de M. Léon Mahillon, dont l'ardeur enthousiaste contribua pour une si large part à l'heureuse création de ces assemblées. Toutefois nous pouvons nous réjouir du legs de remarquables projets qu'il nous a laissé et ce sera une digne commémoration de son travail et de la coopération d'autres encore que la mort nous a enlevés, que de maintenir dans la suite de nos Congrès cette élévation d'idées et ces ambitions utiles dont ils ont fait preuve et qu'ils ont cherché à répandre. Dans un discours d'un caractére aussi général il ne serait peut-être pas sans intérêt, avant de parler du but spécial que nous espérons atteindre, de faire allusion, sans vous fatiguer par des details pédants, à l'origine des Congrès et aux influences sociales et industrielles qui ont contribué peu à peu à en étendre de plus en plus le cadre primitif.

Le mot "Congrès" en lui-même nous fournit une preuve curieuse de cette constante oscillation d'importance et d'étendue technique qui

rend la biographie des mots, considérés comme symboles et symptômes des mouvements sociaux et des conditions variées de l'existence, d'un intérêt si absorbant et si constant dans l'interprétation des progrès humains. Pareil au rhytme récurrent des procédés sociaux, généralisé par Saint Simon d'une façon si frappante, les mots passent d'une signification spéciale à une signification générale, et retrécissent ensuite de nouveaux ces limites pour retomber dans une sphère plus étroite. Bien que cette étude, par la nature même du sujet, soit évidemment incomplète car ainsi que Horne Tooke nous l'a rappellé, les mots ont le don des ailes, il apparaitrait cependant, qu'au début, d'après les usages anglais, tels que nous les montrent la coutume littéraire du XVIe siècle, le titre de Congrès s'appliquait à une simple rencontre de quelques personnes, et s'étendit au XVIIe siècle à une combinaison ou coalescence d'objets matériels ; signification variée aussi par son application à des réunions où l'union était remplacée pas les discussions ; jusqu'à ce que, enfin, ce mot parait avoir acquis un sens technique et avoir été restreint à désigner des assemblées de Souverains ou de plénipotentiaires accrédités, convoquées dans le but d'obtenir une paix générale ou partielle et d'arranger à des occasions suprêmes dans des debâts conciliatoires, les intérêts contradictoires des puissances nationales. Et je crois qu'en langage diplomatique, ce mot s'applique actuellement, par opposition au mot Conférence, à des réunions solennelles de fonctionnaires d'Etat du plus haut rang ayant à conclure une paix générale. Dans un ancien travail historique, on emploie cette expression en décrivant l'établissement des Constitutions de Clarendon entre Henri II et le Conseil des Nobles et des Prélats, pour fixer l'ordre ecclésiastique; et dans un sens plus large mais analogue, il fut appliqué à l'un des premiers Congrès, convoqué en 1636 à Cologne, pendant le durée de la Guerre de Trente Ans, dont l'intention expresse était l'achèvement de négociations pacifiques d'un caractère international. Donc, à part une seule légère déviation d'emploi, tombée en désuétude, ce titre a été synonyme d'une tentative d'établir l'unité et l'action en commun; et cette signification propice a été maintenue durant le cours des applications successives qu'on en a faites ultérieurement.

Sans insister davantage sur le côté philologique de cette question, je voudrais indiquer que la transmutation de ce type de société qu'on a désignée sous le nom de "militante" en cette forme sociale qu'on a appelée "industrielle", fournit une condition essentielle de l'expansion heureuse de ces assemblées jusque dans les domaines pacifiques du Commerce, de la Littérature, de l'Art, de la Science, et, en général, dans les sphères de toute entreprise intellectuelle ou industrielle.

Le caractère prédominant du type de vie militante est évidemment *ex rei necessitate,* une répulsion mutuelle; les distinctions de race et les divisions géographiques prescrivent concurremment les limites de l'échange national et local; la sympathie languit entre ses bornes restreintes et tend à atteindre ce maximum de concentration qui peut à peine exister dans la vie sociale; la coopération mutuelle sur une échelle un peu étendue est réprimée par la prédominance d'une espèce de contrainte ; et le développement d'une section quelconque du monde civilisé est considéré comme devant principalement dépendre de la décadence ou de la ruine des communautés voisines; de sorte que la conception d'une généreuse république scientifique ou intellectuelle,

y songeât—on momentanément, apparaissait sous la forme chimérique d'un rêve irréalisable. Aussi le caractère national n'étant que l'union complexe des natures individuelles qui constituent la masse,—la forme nationale et la forme individuelle agissant et réagissant réciproquement et continuellement,—cette situation agressive régnait dans toutes les carrières, dans toutes les conditions. Même les physiciens, "Maîtres de ceux qui savent" ("Masters of those who know") que, pour employer la phrase de Tennyson, l'on peut s'imaginer

" . . . . planant
"Dans l'espace lumineux compris entre les mondes,
"Où ne passe aucun nuage, où ne souffle aucun vent."

" . . . . haunt
"The lucid interspace of world and world,
"Where never creeps a cloud or moves a wind",

même ceux-là s'efforcèrent, en maintes circonstances, de cacher leurs découvertes scientifiques aux confrères de leur pays, conservant pour eux-mêmes les possessions intellectuelles qui appartenaient à juste titre à l'humanité tout entière; tandis qu'à travers les rivalités de nation à nation, il ne se montrait jamais la moindre trace d'énergie tendant à atteindre un but commun dont la réalisation s'élèverait au-dessus des distinctions arbitraires de race et de climat.

Dans le vaste aperçu du royaume intellectuel que Lord Bacon a tracé dans le De Augmentis Scientiarum, il déplorait particulièrement ce manque de sympathie locale et internationale, qu'il considérait comme un obstacle sérieux aux progrès des connaissances humaines; et, s'inspirant d'un modèle divin, il exprima prophétiquement et solennellement l'espoir qu'il y aurait un jour, pour citer ses propres paroles, une "fraternité du savoir et de l'illumination" ("fraternity of learning and illumination"). Cette aspiration ne fut véritablement réalisée que quand le type militant de la société, type répulsif, eut, avec ses splendeurs souillées et fanées, disparu peu à peu, faisant place au type industriel qui cherchait son incarnation idéale dans le travail volontairement fait en commun et dans l'inspiration mutuelle dont le but unique effacerait les traces de l'infertilité et de la pauvreté du travail isolé et souvent discordant.

Et, pour limiter cette considération à l'élément qui touche plus directement à nos études professionnelles, remarquons que les historiens du progrès intellectuel,—particulièrement Buckle dans son "Histoire de la Civilisation" et Lecky dans son "Histoire du Progrès et de l'Influence du Rationalisme en Europe",—ont constaté, avec force louanges, qu'un facteur suprême de cette recherche naissante de l'unité, de cette transition d'un type exclusif à un type inclusif, c'était la fusion des doctrines éclairées d'une économie politique systématique et leur propagation à travers le monde par des investigateurs et des interprètes aussi prudents qu'enthousiastes. Car quoique, ainsi que l'ont démontré Buckle et Bagehot, la doctrine de l'économie politique, à cause de la complication profonde qu'elle offrait eu égard aux désirs, aux émotions et aux buts humains, quoique cette doctrine dût, pour la simplification scientifique, être dénuée d'une partie de ses prémisses —de sorte que l'élément humain prenait une forme mi—imaginaire et les buts discutés paraissaient revêtir un caractère essentiellement

égoïste,—cependant l'influence et les effets tendaient clairement, progressivement et d'une façon efficace vers la consolidation sociale et la dépendance mutuelle. Le type industriel de la société, ainsi animée et guidée, mûrit de façon bienfaisante, adoucissant les caractères rudes et méfiants de la vie sociale qui revêtit alors l'aspect heureux des relations continues dont ce Congrès est, dans notre sphère d'activité, l'expression symbolique.

La profonde vérité de la psychologie sociale, si je puis employer cette expression, que M. Herbert Spencer fit reconnaître, reconquit ainsi graduellement la pensée de l'homme, et dirigea et stimula l'espoir grandissant,—la doctrine, veux-je dire, que la source première de l'effort humain dans tous les ressorts de l'activité mentale, morale et sociale, et particulièrement sous forme de corporation, ne consiste pas, pour employer le langage philosophique, en une cognition de l'entendement, mais en une émotion du cœur—Or, sous ces conditions et ces impulsions régénérées, le sentiment acquit une domination légitime et cette généreuse spontanéité d'union, ainsi qu'un courant rendu libre, après avoir été longtemps arrêté, se répandit et se répandra toujours, inspirant partout une nouvelle vigueur, dans toutes les voies naturelles de la vie universelle.

Depuis lors les Congrès ont réuni en fédérations utiles les diverses branches des intérêts économiques, sociaux, littéraires et intellectuels, on peut les considérer à juste titre comme la plus vaste des manifestations sociales et sympathiques de toute activité mentale ou technique collective ; et le nom, par suite de cette conception sociale élevée, a repris son ancienne signification, celle d'une assemblée de personnes ou de corporations cherchant à établir une émulation et une aide réciproques.

La science a été avec raison considérée comme un fonds universel de richesses intellectuelles ; aucune frontière territoriale, aucune possession exclusive ne peut la restreindre ; chaque travailleur accepte d'y ajouter ses acquisitions individuelles ; chaque travailleur a la droit d'en retirer cette part de richesses à laquelle sa patience et son labeur fourniront un accroissement intellectuel qui sera de nouveau ajouté au fonds commun.

Et il me sera permis, comme étudiant de l'histoire sociale, d'affirmer que l'institution des Congrès est en quelque sorte l'acte de foi d'un facteur naturel et intégral du développement humain, puisqu'ils sont un exemple de cette méthode d'évolution qu'on peut discerner dans tout progrès organique, mental et moral. Pour employer l'expression de M. Herbert Spencer, ils démontrent le principe dominant de la réintégration finale qui suivra ces nombreuses ramifications que la complexité croissante de la science produit dans la construction originelle plus simple du travail associé. La profession de l'actuariat a ainsi imposé ses droits à la permanence dans l'échelle de l'ordre intellectuel et professionnel, par le caractère spontané et continu de son évolution. Elle a les signes distinctifs d'un organisme progressif, où, pour employer le langage précis de Kant, chaque portion est réciproquement et simultanément un moyen et un but vers l'accomplissement des fonctions totales qu'il est appelé à exercer. La partie n'est pas, dans le mécanisme général, simplement en corrélation avec la partie ; la fonction n'existe pas simplement dans une co-dépendance essentielle d'une autre fonction ; mais un

Congrès, pour pousser plus loin cette profonde analogie, fournit le signe capital et consommé d'une efficacité organique complète par l'action sympathique de sections diverses, mais unifiées, sur une vaste échelle.

Si nous considérons les influences inhérentes aux Congrès nous remarquons non seulement qu'ils animent et concentrent le travail et les investigations des corps professionnels individuels y interéssés, mais que le génie qu'ils incorporent est essentiellement cet esprit large qui constitue l'élément le plus puissant à fondre les nations elles-mêmes en une unité de pensées et de sentiments—la plus haute expression de la civilisation sous sa forme vraie—tout en conservant les caractères locaux distinctifs qui produisent l'harmonie de la vie.

Considérant maintenant les fonctions d'un Congrès, à notre point de vue spécial, nous découvrons l'avantage mutuel d'un service professionnel et d'un service personnel. Nous dotons d'une unité systématique nos investigations professionelles par l'adoption d'un système uniforme de langage symbolique; nous devenons ainsi possesseurs et héritiers d'une langue commune et intelligible qui échappe à l'influence des dialectes locaux; les diverses langues de Babel, de l'ancienne allégorie redeviennent un langage uniforme grâce à ce lien, nous resserrons plus étroitement les éléments épars d'un patrimoine scientifique universel; le raffinement et la compétence de notre langue analytique réagit, ainsi que cela a si souvent eu lieu dans l'histoire des mathématiques, sur les possibilités subtiles et potentielles des recherches; nous encourageons la culture des méthodes généralement établies par l'aide coopérative d'intelligences formées; de plus étroites sphères d'action s'élargissent et se précisent par l'influence éclairée de la discussion; nos diverses contributions ne fournissent pas seulement une masse imposante de documents organisés servant de base à une utile déduction future, mais elles stimulent aussi par la variété des opinions et par la suggestion, l'application productrice de nos principes scientifiques à une enquête plus large et plus fructueuse; la profession, juncta juvant, acquiert une organisation compacte de vitalité et d'aptitude, qui l'investit non seulement de la force marquante d'un corps scientifique organique, mais aussi d'un pouvoir d'autorité comme source de référence aux yeux du monde; tandis que, supérieur presque à toutes ces actions ancellaires, ce contact personnel d'esprit à esprit, de pensée à pensée, varié par d'agréables intermèdes de plaisirs sociaux rend nos divers labeurs plus définis, plus vivaces et plus conclusifs; la rivalité, pour citer les mots passionnés de Burke "perd la moitié du mal en perdant toute sa grossièreté", et le travail lui même est enrichi par le charme et le souvenir de la camaraderie intime.

Dans le rêve osé mais pratique de la "New Atlantis" la corporation des mercatores Luminis amassa au Collège Central les résultats de la science et l'opulence de pensées qu'elle avait recueillies pendant les explorations dans les pays étrangers; l'Actuaire dans ses Congrès, a converti cette quête exclusive en une quête sympathique, puisque nos Marchands de lumière intellectuelle viennent de tous les pays afin d'accroitre un gain universel et illimité.

Si nous concentrons notre attention sur l'avenir, en examinant l'étendue et la variété des sujets à soumettre au Congrès, il sera des plus évident combien est sans fondement l'idée qui cherche à fixer

une limite à la direction et à l'utilité de notre travail commun. Ces contributions prouvent d'une façon concluante que l'étendue de notre pouvoir n'est nullement épuisée et qu'elle n'est pas restreinte à la région confinée des seuls intérêts de l'Actuariat; que, au contraire, nos principes et nos méthodes lesquels à travers de longues peripéties, se sont façonnés et perfectionnés, possèdent une souplesse facile et une compétence d'application qui font foi de leur capacité distinctive de services à rendre dans le domaine de l'économiste, de l'homme d'état et du réformateur social. C'est précisement un Congrès qui présente, sous une forme massive condensée et éminemment intelligible, les capacités de notre vie professionnelle et qui révèle l'héritage riche et étendu que les efforts ardents faits par vos prédécesseurs et par vous-mêmes assureront à ces successeurs dont ce sera l'heureuse fortune de saisir et d'élever le flambeau du Savoir jusque dans des régions d'investigation non encore explorées.

En annonçant officiellement l'ouverture du Congrès, je m'associe à vous dans une confiance fervente et assurée que nos délibérations encourageront d'une manière efficace la consolidation de notre profession dans le monde entier, réuniront les travailleurs, n'importe où ils peinent par l'énergie et les espérances d'une république scientifique pratique; de sorte que l'Actuaire fera de plus en plus valoir ses droits inattaquables à exprimer ces fières paroles d'Enée, quand il aperçut le labeur des Troyens, représenté sur un autel étranger.

Quæ Regio in terris nostri non plena laboris.

Über eine neue mechanische Ausgleichungsmethode.

VON DR. JOHANNES KARUP.

Die Ansichten der Techniker über die zweckmässigste Methode, Mortalitätstafeln und ähnliche statistische Beobachtungsreihen auszugleichen, gehen heutzutage noch weit auseinander. Während der Eine der graphischen Methode den Vorzug giebt, wendet der Andere eine mechanische Ausgleichungsformel nach Art der Woolhouse'schen an und gründet ein Dritter seine Rechnung auf ein analytisches Gesetz, wie es die Gompertz-Makeham'sche Formel darstellt. Gemeinsam ist allen neueren Methoden aber die Tendenz, sich merklich nur an solchen Stellen, wo offenbar zufällige Störungen der wahren Kurve vorliegen, von den Originalbeobachtungen zu entfernen und andererseits die Endresultate so regelmässig zu gestalten als ob sie thatsächlich aus einem analytischen Gesetze hervorgegangen wären. Diese Tendenz engt den Spielraum, innerhalb welchen sich die endgültig gewonnene Sterblichkeitsskala bewegen kann, ziemlich ein, und es liegen daher die Resultate verschiedener guter Ausgleichungen garnicht weit auseinander, und jedenfalls viel weniger, als der nicht in der Technik Bewanderte gewöhnlich annimmt.

Wäre ein analytisches Gesetz bekannt, dem sich die Sterblichkeit unter allen Umständen anschlösse, so würde es offenbar am richtigsten sein, die Ausgleichung nach diesem Gesetz vorzunehmen und die darin vorkommenden Konstanten nach der Methode der kleinsten Quadrate aus den Beobachtungen zu bestimmen. Allein ein solches Gesetz ist bisher nicht gefunden worden und wird auch schwerlich jemals gefunden werden, da die Sterblichkeitsursachen sehr komplicirter Natur und in fortwährendem Flusse sind, und alle analytischen Ausgleichungen können daher nur als Versuche gelten, die je nach dem Ergebnisse als zufriedenstellende anzusehen sind oder nicht. Je mehr aber die Versicherungstechnik fortschreitet und das Beobachtungsmaterial wächst, desto häufiger wird man die Sterblichkeit nicht bloss nach Alter und Geschlecht, sondern auch nach Versicherungsjahren, Versicherungs-

kombinationen und anderen Momenten untersuchen und feststellen wollen und um so grösser werden die Schwierigkeiten sein, die sich einer analytischen Behandlung des Problems entgegen stellen. Ich glaube daher, dass die Zeiten, wo man die Erfahrungen von Lebensversicherungsanstalten nach einer analytischen Formel, wie die Gompertz-Makeham'sche, auszugleichen suchte, ziemlich vorüber sind, und dass man sich künftighin fast ausschliesslich den rein mechanischen Formeln, welche sich beliebigen Kurven anschliessen, und der graphischen Methode zuwenden wird. Die Gompertz'sche Formel selbst wird damit nicht ihre Bedeutung einbüssen, sie wird sich vielmehr nach wie vor, wie schon Sorley betont hat, bei vielen theoretischen Untersuchungen und bei der Berechnung complicirter Beobachtungswerthe als nützlich erweisen. Und ebensowenig wird es überflüssig werden, nach neuen analytischen Ausdrücken für die Sterblichkeit zu suchen, da auf diesem Wege noch manche Bereicherung der Praxis und Theorie wohl möglich ist, die mit dem Ausgleichungsproblem in keinem Zusammenhange steht.

Die Woolhouse'sche Ausgleichung, welche zuerst an den Tafeln der 20 engl. Gesellschaften erprobt wurde, hat seiner Zeit viel Anklang gefunden und besitzt auch jetzt noch Anhänger. In der That übertrifft dieses Verfahren alle früher ersonnenen mechanischen Ausgleichungen sowohl in theoretischer als praktischer Hinsicht, denn während letztere zumeist in einfachen Durchschnitten oder Interpolationen bestanden, bei denen das Material in sehr ungleicher Weise zur Verwendung kam, berücksichtigt jenes die wahre, aber zunächst unbekannte Kurvatur der in Frage kommenden Funktion und zieht für jeden Punkt eine gleiche Zahl von symmetrisch gelagerten Beobachtungswerthen in Betracht. Dabei ist das Rechnungsschema selbst, zumal wenn man das verbesserte von Ackland oder Higham benutzt, einfach und der Anschluss an die Beobachtungen recht zufriedenstellend, sei es, dass man die Zahlen der Lebenden in der Dekremententafel in Betracht zieht oder rechnungsmässige und wirkliche Sterbefälle vergleicht. Nur die Regelmässigkeit der Ergebnisse lässt zu wünschen übrig und es ist daher dankenswerth, wenn Higham Formeln aufgestellt hat, welche äusserlich den Woolhouse'schen ähneln und jenen Übelstand nur im beschränkterem Maase im Gefolge haben. Merkwürdigerweise haben die Higham'schen Entdeckungen verhältnissmässig wenig Beachtung gefunden, was sich einerseits vielleicht daraus erklärt, dass die theoretische Grundlage hier weniger einfach und durchsichtig ist, als bei Woolhouse, zum Theil aber wohl auch darauf zurückgeführt werden muss, dass die graphische Methode inzwischen mehr in den Vordergrund getreten ist. Während man nämlich früher allgemein der Ansicht war, dass diese Methode sich vorzugweise für Beobachtungen geringen Umfanges eigne, hat Sprague neuerdings an einem hervorragenden Beispiel, der $H^{M(5)}$ Tafel bewiesen, dass diese Methode auch bei grossem Material zu vorzüglichen Resultaten führen kann, wenn man die Kurve mit einigem Geschick zieht und allmählich auf Grund der wirklichen und rechnungsmässigen Sterbefälle verbessert. Damit ist der graphischen Methode ein weites Versuchsfeld eröffnet und es wird Sprague sicherlich nicht an Nachahmern fehlen, wie schon die werthvollen Arbeiten Chatham's beweisen.

Die graphische Methode hat indess gerade so gut ihre Schwächen,

wie die Woolhouse'sche. Die Schwächen jener liegen darin, dass sie eine gewisse Fertigkeit im Zeichnen voraussetzt, die nicht jeder Techniker besitzt, und es dem Ermessen des Rechners überlässt, in wie weit eine vorhandene Schwankung in der Sterblichkeit als gesetzmässig anzusehen und demgemäss beizubehalten ist oder nicht. Sprague sieht in diesem Umstand allerdings grade einen Vortheil und sicherlich ist es auch ein solcher, wo ein sehr dürftiges Material vorliegt und man einen richtigen Begriff von der wahren Kurve nur durch einen Vergleich mit anderweitigen Beobachtungen gewinnen kann. Aber bei grossem Beobachtungsmaterial wird man einer Ausgleichung, welche sich ausschliesslich auf dieses stützt, und die gewünschte Regelmässigkeit auch ohne künstliche oder wechselnde Gruppirung der Beobachtungen erzielt, jedenfalls den Vorzug geben.

Ich glaube daher, dass die nachstehenden Untersuchungen, die sich mit einer neuen mechanischen Methode beschäftigen, welche *allen* Anforderungen genügt, die man bisher an eine gute Ausgleichung gestellt hat, nicht ohne Interesse sein werden. Freilich passt auch diese Methode nicht für kleine Beobachtungszahlen, für die wohl immer das graphische Verfahren neben einem rein analytischen—ich erinnere an die Makeham'sche Untersuchung im XVI. Bande des *Journal of the Institute of Actuaries*—das einzig zulässige sein wird.

Das neue Verfahren zerfällt in drei getrennte Operationen, eine vorläufige Ausgleichung der gegebenen Sterbenswahrscheinlichkeiten nach einer einfachen mechanischen Formel, eine darauf folgende Korrektion auf Grund der rechnungsmässigen und wirklichen Sterbefälle und eine definitive Ausgleichung, wobei eine neue Funktion, der Logarithmus der Sterbenswahrscheinlichkeit zu Grunde gelegt wird. Durch die wiederholte Ausgleichung wird die Regelmässigkeit der Resultate gesteigert, zumal die zweite Ausgleichung nach einer Formel vorgenommen wird, welche viel stärker ausgleicht, als die bisher bekannten einschlägigen Formeln, während die Korrektion nach den wirklichen und rechnungsmässigen Sterbefällen dafür sorgt, dass die Gewichte der einzelnen Beobachtungen zur Geltung kommen und man sich trotz der zusammengesetzten Operationen nicht allzuweit von den Originalbeobachtungen entfernt. Eine Berücksichtigung der Gewichte ist, wie man weiss, weder von Woolhouse noch von Higham vorgesehen und man hat hieraus häufig genug einen Einwand gegen ihre Verfahren hergeleitet. Einem Einwande dieser Art beugt also die neue Methode von vornherein vor, ausserdem reducirt sie, wie in der Folge nachgewiesen werden soll, den theoretischen Fehler, welchen Sprague für die Woolhouse'sche Methode nachgewiesen hat, auf einen kleinen Bruchtheil desselben und entzieht damit dem letzten Einwande, welcher gegen mechanische Ausgleichungen bisher geltend gemacht wurde, den Boden.

Ich gehe zunächst dazu über, die bei der zweiten Ausgleichung benutzte Formel abzuleiten. Dazu sind aber einige vorbereitende Untersuchungen nöthig, die in den Abschnitten 1 und 2 behandelt werden sollen.

1. Oskulirende Interpolation.

Dem Woolhouse'schen Verfahren liegt bekanntlich die Idee zu Grunde, dass man aus den unausgeglichenen Lebenden der Dekrementafeln n neue Tafeln ableiten kann, wenn man für jede zunächst nur

n-jährige Intervalle in Betracht zieht, das Intervall von Tafel zu Tafel um je 1 Jahr verschiebt und in jeder n-jährige Tafel die fehlenden Glieder der einzelnen Jahre durch Interpolation ergänzt. Die somit gewonnenen Tafeln können als eben so viele Annäherungen an die gesuchte wahre Absterbeordnung betrachtet werden und Woolhouse konstruirt die definitive Tafel, indem er aus jenen das arithmetische Mittel nimmt.

Dass die Zahlen der Lebenden der einzelnen Lebensjahre, ebensogut wie die zugehörigen Sterbenswahrscheinlichkeiten, aus den für grössere Intervalle gegebenen Werthen mit Hülfe von Interpolation ziemlich genau bestimmt werden können, zeigt jede nur einigermaassen ausgeglichene normale Sterblichkeitstafel und es entbehrt also das Woolhouse'sche Princip nicht der theoretischen Begründung. Unbekannt dürfte es aber sein, dass die Bildung des Mittels vom Standpunkte der Wahrscheinlichkeitsrechnung aus eine einfache Konsequenz der Interpolation ist. Der Beweis hierfür ist nicht schwer. Nimmt man mit Woolhouse an, dass eine Interpolation aus fünfjährigen Intervallen mit $2^{t.n}$ centralen Differenzen genügt, so hat man als die theoretischen Werthe der ausgeglichenen Funktion ϕ für die Strecke von—7 bis 7 :

$$\begin{aligned}
\phi_{-7} &= \phi_{-5} - \frac{2}{5}\cdot\frac{\phi_0-\phi_{-10}}{2} + \frac{4}{50}\cdot(\phi_0 - 2\phi_{-5} + \phi_{-10})\\
\phi_{-6} &= \phi_{-5} - \frac{1}{5}\cdot\frac{\phi_0-\phi_{-10}}{2} + \frac{1}{50}\cdot(\phi_0 - 2\phi_{-5} + \phi_{-10})\\
\phi_{-5} &= \phi_{-5}\\
\phi_{-4} &= \phi_{-5} + \frac{1}{5}\cdot\frac{\phi_0-\phi_{-10}}{2} + \frac{1}{50}\cdot(\phi_0 - 2\phi_{-5} + \phi_{-10})\\
\phi_{-3} &= \phi_{-5} + \frac{2}{5}\cdot\frac{\phi_0-\phi_{-10}}{2} + \frac{4}{50}\cdot(\phi_0 - 2\phi_{-5} + \phi_{-10})\\
\phi_{-2} &= \phi_0 - \frac{2}{5}\cdot\frac{\phi_5-\phi_{-5}}{2} + \frac{4}{50}\cdot(\phi_5 - 2\phi_0 + \phi_{-5})\\
\phi_{-1} &= \phi_0 - \frac{1}{5}\cdot\frac{\phi_5-\phi_{-5}}{2} + \frac{1}{50}\cdot(\phi_5 - 2\phi_0 + \phi_{-5})\\
\phi_0 &= \phi_0\\
\phi_1 &= \phi_0 + \frac{1}{5}\cdot\frac{\phi_5-\phi_{-5}}{2} + \frac{1}{50}\cdot(\phi_5 - 2\phi_0 + \phi_{-5})\\
&\vdots\\
\phi_7 &= \phi_5 + \frac{2}{5}\cdot\frac{\phi_{10}-\phi_0}{2} + \frac{4}{50}\cdot(\phi_{10} - 2\phi_5 + \phi_0)
\end{aligned}$$

Nun erhält man die besten oder wahrscheinlichsten Werthe der in einer Funktion enthaltenen Konstanten (gleiche Gewichte vorausgesetzt) bekanntlich dadurch, dass man zwischen den theoretischen und wirklich beobachteten Werthen die Differenzen nimmt, diese quadrirt und summirt und die Konstanten, zu denen hier ϕ selbst gehört, so bestimmt, dass die Summe ein Minimum wird. Führt man aber jene Operationen aus und differentiirt nach ϕ, so ergiebt sich nach einigen Umformungen die Gleichung

$$\begin{aligned}
\phi - \frac{54}{3125}\cdot\Delta^4\phi_{-10} = \frac{1}{125}\cdot(&25l + 24l_1 + 21l_2 + 7l_3 + 3l_4 - 2l_6 - 3l_7\\
&+ 24l_{-1} + 21l_{-2} + 7l_{-3} + 3l_{-4} - 2l_{-6} - 3l_{-7})
\end{aligned}$$

worin l, l_1, l_{-1} . . . die auszugleichenden Beobachtungen bedeuten, $\Delta^4\phi_{-10}$ die 4te Differenz aus ϕ_{-10}, ϕ_{-5}, ϕ, ϕ_5, ϕ_{10} ist, so dass $\frac{54}{3125}\Delta^4$. zumeist gegen ϕ vernachlässigt werden darf, und die rechte Seite nichts Anderes als die Woolhouse'sche Endformel darstellt. Damit ist bewiesen, dass die Woolhouse'sche mittlere Kurve in der That das beste Resultat giebt, welches sich auf Grund der angenommenen Interpolation erzielen lässt.

Das Intervall von 5 Jahren dürfte das zweckmässigste sein, welches sich wählen lässt, da die Rechnung mit anderen Intervallen unbequem ist oder eine ungenügende Ausgleichung herbeiführt. Die bei der Woolhouse'schen Methode zurückbleibenden Unregelmässigkeiten rühren zum grössten Theil auch nicht davon her, dass das Intervall zu klein gewählt ist, sondern davon, dass Woolhouse bei 2ten centralen Differenzen stehen geblieben ist. Wendet man 3te oder 4te Differenzen an, so entsteht schon ein besseres Resultat. Allein auch eine derartige Interpolation wird, wenn sie in gewöhnlicher Weise vorgenommen wird, in den primären Tafeln, aus welchen sich die endgültige zusammensetzt, an den Stellen Sprünge zeigen, wo ein Wechsel in den Beobachtungswerthen stattfindet und ich ziehe daher eine solche vor, wie sie Sprague in seiner vortrefflichen Abhandlung " Explanation of a New Formula, &c." (*J.I.A.* vol. xxiii., p. 270) dargelegt hat. Dieses Verfahren gründet sich, kurz gesagt, auf Folgendem. Hat man zwischen einer Reihe von Werthen y_{-1}, y_0, y_1, y_2 . . , die keinem einfachen Gesetz genügen, zu interpoliren, so kann man zunächst für jeden schon gegebenen Punkt die zugehörige 1ste und 2te Derivirte aus dem betreffenden Werthe selbst und den zwei vorausgehenden und zwei folgenden Werthen unter der Voraussetzung bestimmen, dass durch diese Punkte eine parabolische Kurve 4ten Grades gelegt wird. Alsdann interpolirt man von Intervall zu Intervall, indem man für jedes eine Kurve fünften Grades gelten lässt, die im Anfangs- und Endpunkte die ursprünglich gegebenen Werthe wiedergiebt und deren Derivirte in eben diesen Punkten mit den zugehörigen, schon berechneten zusammenfallen. Indem Sprague diese Operationen theoretisch durchführt, gelangt er schliesslich zu einer Interpolationsformel fünften Grades, die sich unter Anwendung centraler Differenzen für das Intervall $x=0$ bis $x=1$ so wiedergeben lässt:

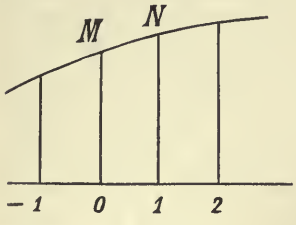
$$y_x = y_0 + x\Delta y_0 + \frac{x(x-1)}{2}\cdot\Delta^2 y_{-1} + \frac{(x+1)\,x\,(x-1)}{2.3}\cdot\Delta^3 y_{-1}$$
$$+\frac{(x+1)\,x\,(x-1)\,(x-2)}{2.3.4}\cdot\Delta^4 y_{-2} + \frac{x^3\,(x-1)\,(5x-7)}{2.3.4}\cdot\Delta^5 y_{-2}, \quad . \quad (1)$$

worin die Differenzen Δ, Δ^2, . . in bekannter Weise nach dem System

y_{-2}					
	Δy_{-2}				
y_{-1}		$\Delta^2 y_{-2}$			
	Δy_{-1}		$\Delta^3 y_{-2}$		
y_0		$\Delta^2 y_{-1}$		$\Delta^4 y_{-2}$	
	Δy_0		$\Delta^3 y_{-1}$		$\Delta^5 y_{-2}$
y_1		$\Delta^2 y_0$		$\Delta^4 y_{-1}$	
	Δy_1		$\Delta^3 y_0$		
y_2		$\Delta^2 y_1$			
	Δy_2				
y_3					

zu berechnen sind.

Das Verfahren liefert, wie Sprague selbst gezeigt hat, sehr gute Resultate, lässt sich hier aber kaum verwerthen, weil es zu viele Differenzen in Betracht zieht und damit die Rechnung komplicirt. Ich habe deshalb unter Beibehaltung des Sprague'schen Gedankenganges eine neue Formel abgeleitet, welche nur die Derivirten 1ten Grades berücksichtigt und zu einer Interpolation 3ten Grades führt. Die Ableitung gestaltet sich wie folgt.



Man hat ganz allgemein

$$\frac{y_1-y_{-1}}{2}=y_0'+\frac{1}{1\,.\,2\,.\,3}\cdot y_0'''+\ \ldots$$

$$\frac{y_2-y_0}{2}=y_1'-\frac{1}{1\,.\,2\,.\,3}\cdot y_1'''+\ \ldots$$

woraus sich ergiebt, wenn nur Differenzen 2ter Ordnung in Betracht gezogen werden,

$$\left.\begin{aligned} y_0'&=\frac{y_1-y_{-1}}{2}=\frac{\Delta_0+\Delta_{-1}}{2}=\Delta_0-\frac{\Delta^2_{-1}}{2}\\ y_1'&=\frac{y_2-y_0}{2}=\frac{\Delta_1+\Delta_0}{2}=\Delta_0+\frac{\Delta_0^2}{2}\end{aligned}\right| \quad (a)$$

Soll die Funktion, welche definitiv das Kurvenstück MN darstellt, in den Punkten 0 und 1 mit y_0 und y_1, ihre Derivirten in eben diesen Punkten mit den erlangten y_0' und y_1' zusammenfallen, so muss sie mindestens 3ten Grades sein. Wir setzen daher die unbestimmte Form an

$$y=(1-x)^2\,.\,[A_0+A_1x]+x^2\,.\,[B_0+B_1(1-x)] \qquad (b)$$

die, wie man leicht einsieht, jede beliebige rationale ganze Funktion 3ten Grades darstellen kann, und erhalten nunmehr

$$y_x'=-2(1-x)\,.\,[A_0+A_1x]+(1-x)^2\,.\,A_1+2x[B_0+B_1(1-x)]-x^2B_1 \qquad (b_1)$$

Für $x=0$ und $x=1$ geben (b) und (b_1)

$$\begin{aligned} y_0&=A_0\\ y_1&=B_0\\ y_0'&=-2A_0+A_1\\ y_1'&=2B_0-B_1\end{aligned}$$

oder $A_0=y_0$, $A_1=y_0'+2y_0$

$B_0=y_1$, $B_1=-y_1'+2y_1$

und man hat also auch

$$y_x=(1-x)^2\,.\,[(1+2x)y_0+xy_0']+x^2[(3+2x)\,.\,y_1-(1-x)\,.\,y_1']$$

oder

$$\begin{aligned} y_x=&(1-3x^2+2x^3)y_0+(3x^2-2x^3)y_1\\ &+x(1-x)^2\,.\,y_0'-x^2\,.\,(1-x)\,.\,y_1'\end{aligned}$$

Setzt man hierin die Ausdrücke unter (a), so ergiebt sich schliesslich nach einigen Umformungen

$$y_x=y_0+x\Delta y_0+\frac{x(x-1)}{2}\,.\,\Delta^2y_{-1}+\frac{x^2(x-1)}{2}\,.\,\Delta^3y_{-1}\quad .\quad . \quad (2)$$

womit die von uns gesuchte, für das Intervall $x=0$ bis $x=1$ gültige Formel erlangt ist.

Für die gewöhnliche centrale Interpolation 5ten Grades lautet die Formel

$$y_x = y_0 + x\Delta y_0 + \frac{x(x-1)}{2} \cdot \Delta^2 y_{-1} + \frac{(x+1)x(x-1)}{2.3} \cdot \Delta^3 y_{-1}$$

$$+ \frac{(x+1)x(x-1)(x-2)}{2.3.4} \cdot \Delta^4 y_{-2} + \frac{(x+2)(x+1)x(x-1)(x-2)}{2.3.4.5} \cdot \Delta^5 y_{-2}$$

und diese gilt auch für die 4ten, 3ten Grades u.s.f., wenn man das letzte oder die beiden letzten Glieder u.s.f. weglässt. Man sieht somit, dass die neuen Formeln sich nur im letzten Gliede von den gewöhnlichen unterscheiden, was auch leicht erklärlich ist, wenn man die Entstehungsweise jener in Betracht zieht. Denn sobald die Werthe y_{-2}, y_{-1}, y_0, y_1, y_2, y_3 einer und derselben Kurve 4^{tcn} Grades genügen, muss die Sprague'sche Interpolation offenbar mit der gewöhnlichen 4ten Grades zusammenfallen und ein ähnlicher Zusammenhang besteht zwischen der neuen Formel (2) und der gewöhnlichen für centrale Interpolation zweiten Grades.

Die aus Formel (2) und (1) hervorgehenden Kurvenstücke haben die Eigenschaft, dass sie in den Anfangs- und Endpunkten sich nicht nur genau an diejenigen des benachbarten Intervalls anschliessen, sondern hier auch dieselben Derivirten 1ter bez. 1ter und 2ter Ordnung haben. Nach Analogie eines in der Himmelsmechanik gebräuchlichen Ausdruckes wird man die neue Interpolation, im Gegensatz zu der gewöhnlichen, daher passend als *oskulirende* bezeichnen können.

Für die Folge ist es von Werth, wenn wir auch die bei der Woolhouse'schen Ausgleichung benutzte Interpolationsformel durch die Differenzen Δ und Δ^2 . . ausdrücken. Sie lautet

$$y = y_0 + x\Delta y_0 + \frac{x(x-1)}{2} \cdot \Delta^2 y_{-1} \quad . \quad . \quad . \quad . \quad . \quad (3)$$

und zwar ist sie, abweichend von den früheren Formeln, gültig für das Intervall von $x=-\frac{1}{2}$ bis $x=\frac{1}{2}$.

2. Interpolation durch fortgesetzte Abänderung der letzten Differenzenreihe.

Das Woolhouse'sche Princip der Mittelbildung, das auch hier adoptirt werden soll, würde sich leicht auf Formel (2) anwenden lassen, allein die dabei entstehenden Ausdrücke sind nicht praktisch und wir wenden uns daher zunächst einigen weiteren, die Interpolation betreffenden Untersuchungen zu.

Wenn man nicht einen isolirten, sondern eine ganze Reihe von Werthen für regelmässige und einander gleiche Intervalle einzuschalten hat, so bedient man sich bei gewöhnlicher Interpolation zumeist eines Verfahrens, bei dem nicht die Differenzen Δ der Hauptreihe, sondern die für das neue, getheilte, Intervall gültigen Differenzen δ benutzt werden. Die leitenden Differenzen der letzteren Art können leicht aus den gegebenen Differenzen Δ bestimmt werden und da bei einer Interpolation n^{ten} Grades die n^{te} Differenz immer konstant bleibt, so lange nicht neue

Werthe der Hauptreihe in Frage kommen, so reducirt sich die Rechnung schliesslich auf eine successive Addition aller Differenzen. Unter Umständen kann dies Verfahren selbst da vortheilhaft werden, wo δ^n nicht konstant ist und Sprague hat es thatsächlich auch bei der von ihm eingeführten oskulirenden Interpolation angewandt. Allein sowohl hier wie dort wird die Rechnung doch recht lästig dadurch, dass man nicht nur die Differenzen δ^n sondern auch die zugehörigen leitenden δ, δ^2 . . δ^{n-1} mit jedem Wechsel in den Originalwerthen von Neuem berechnen muss, und eine Methode, welche die Operationen auf eine Berechnung der für die *ersten* Werthe von y gültigen leitenden Differenzen δ und eine successive Korrektion der letzten Differenzenreihe allein (mit darauf folgender Aufsummirung) beschränkt, müsste daher als wesentlicher Fortschritt gelten. Eine solche Methode ist nun aber in der That möglich, wenn auch nicht immer praktisch, und glücklicherweise ist sie besonders praktisch, wenn es sich um oskulirende Interpolation handelt. Auch passt sie recht gut für die gewöhnliche Interpolation, wenn diese den 3ten Grad nicht überschreitet, während bei Interpolationen höherer Ordnung zumeist Koëfficienten auftreten, die vielstellig sind und damit die Rechnung die eine Kürzung der Stellen nicht gestattet, wiederum erschwert.

Das neue Verfahren mag an der Formel (2) erläutert werden. Handelt es sich um eine Theilung des ursprünglichen Intervalls in fünf Theile und setzt man

$$x=\frac{k}{5},\ y_x=u_{5k},\ \text{so dass aus der gegebenen Reihe}$$

$$\begin{array}{lccccccccc} & \cdot\cdot & y_{-1} & & & & y_0 & & & y_1 & \cdot\cdot \\ \text{die neue} & \cdot\cdot & u_{-5} & u_{-4} & & \cdot\cdot & u_{-1} & u_0 & u_1 \ldots & u_4 & u_5 & \cdot\cdot \end{array}$$

abzuleiten ist, so kann man (2) die Gestalt geben

$$u_k=u_0+k\,.\,\frac{\Delta u_0}{5}+\frac{k(k-5)}{2}\,.\,\frac{\Delta^2 u_{-5}}{5^2}+\frac{k^2(k-5)}{2}\,.\,\frac{\Delta^3 u_{-5}}{5^3},\quad (2')$$

wobei zu beachten ist, dass sich die Differenzen Δ nunmehr auf fünfjährige, anstatt einjährige Intervalle beziehen. Die Formel gilt für das Intervall 0 bis 5, und um die des folgenden Intervalls von 5 bis 10 zu erhalten, hat man nur nöthig, sämmtliche Indices um 5 zu erhöhen. Nun ist aber $u_5=u_0+\Delta u_0$, $\Delta u_5=\Delta u_0+\Delta^2 u_0=\Delta u_0+\Delta^2 u_{-5}+\Delta^3 u_{-5}$, $\Delta^2 u_0=\Delta^2 u_{-5}+\Delta^3 u_{-5}$, u. s. f. und es ergiebt sich also schliesslich für das Intervall 5 bis 10 die Formel

$$u_{k+5}=u_0+(k+5)\,.\,\frac{\Delta u_0}{5}+\frac{(k+5)k}{2}\,.\,\frac{\Delta^2 u_{-5}}{5^2}+\frac{(k^2+25)k}{2}\,.\,\frac{\Delta^3 u_{-5}}{5^3}$$
$$+\frac{k^2(k-5)}{2}\,.\,\frac{\Delta^4 u_{-5}}{5^3}\quad (2'')$$

worin ausser $\Delta^4 u_{-5}$ nur dieselben Differenzen, wie in (2') vorkommen.

Setzt man in (2') successive $k=0, 1, 2, 3, 4, 5$, in (2''), welches für $k=5$ mit (2') zusammenfällt, successive $k=1, 2$ . . 4, so erhält man u_0, u_1, u_2, . . . u_{10}, und wenn man aus diesen Grössen wieder eine 1te, 2te

und 3te Differenzenreihe ableitet, so entsteht das folgende System, in welchem zur Abkürzung ganz allgemein $\frac{\Delta^q u_p}{5^q} = d_p^q$ gesetzt ist:

Hauptreihe	1te Differenzenreihe
u_0	$d_0 - 2d^2_{-5} - 2d^3_{-5}$
$u_1 = u_0 + d_0 - 2d^2_{-5} - 2d^3_{-5}$	$d_0 - d^2_{-5} - 4d^3_{-5}$
$u_2 = u_0 + 2d_0 - 3d^2_{-5} - 6d^3_{-5}$	$d_0 - 3d^3_{-5}$
$u_3 = u_0 + 3d_0 - 3d^2_{-5} - 9d^3_{-5}$	$d_0 + d^2_{-5} + d^3_{-5}$
$u_4 = u_0 + 4d_0 - 2d^2_{-5} - 8d^3_{-5}$	$d_0 + 2d^2_{-5} + 8d^3_{-5}$
$u_5 = u_0 + 5d_0$	$d_0 + 3d^2_{-5} + 13d^3_{-5} - 10d^4_{-5}$
$u_6 = u_0 + 6d_0 + 3d^2_{-5} + 13d^3_{-5} - 10d^4_{-5}$	$d_0 + 4d^2_{-4} + 16d^3_{-5} - 20d^4_{-5}$
$u_7 = u_0 + 7d_0 + 7d^2_{-5} + 29d^3_{-5} - 30d^4_{-5}$	$d_0 + 5d^2_{-5} + 22d^3_{-5} - 15d^4_{-5}$
$u_8 = u_0 + 8d_0 + 12d^2_{-5} + 51d^3_{-5} - 45d^4_{-5}$	$d_0 + 6d^2_{-5} + 31d^3_{-5} + 5d^4_{-5}$
$u_9 = u_0 + 9d_0 + 18d^2_{-5} + 82d^3_{-5} - 40d^4_{-5}$	$d_0 + 7d^2_{-5} + 43d^3_{-5} + 40d^4_{-5}$
$u_{10} = u_0 + 10d_0 + 25d^2_{-5} + 125d^3_{-5}$	

Index der Hauptreihe	2te Differenzenreihe	3te Differenzenreihe
0		
1	$d^2_{-5} - 2d^3_{-5}$	$3d^3_{-5}$
2	$d^2_{-5} + d^3_{-5}$	$3d^3_{-5}$
3	$d^2_{-5} + 4d^3_{-5}$	$3d^3_{-5}$
4	$d^2_{-5} + 7d^3_{-5}$	$-2d^3_{-5} - 10d^4_{-5} = -2d_0^3$
5	$d^2_{-5} + 5d^3_{-5} - 10d^4_{-5}$	$-2d^3_{-5}$
6	$d^2_{-5} + 3d^3_{-5} - 10d^4_{-5}$	$3d^3_{-5} + 15d^4_{-5} = 3d_0^3$
7	$d^2_{-5} + 6d^3_{-5} + 5d^4_{-5}$	$3d^3_{-5} + 15d^4_{-5} = 3d_0^3$
8	$d^2_{-5} + 9d^3_{-5} + 20d^4_{-5}$	$3d^3_{-5} + 15d^4_{-5} = 3d_0^3$
9	$d^2_{-5} + 12d^3_{-5} + 35d^4_{-5}$	
10		

Bezieht man Δ, wie bisher, auf ein Intervall von 5 Jahren, δ auf ein solches von einem Jahre, so hat man also folgende zusammengehörende Systeme.

Ursprüngliches System

$$
\begin{array}{lllll}
\vdots & & & & \\
u_{-5} & \Delta u_{-5} & & & \\
 & & \Delta^2 u_{-5} & & \\
u_0 & \Delta u_0 & & \Delta^3 u_{-5} & \\
 & & \Delta^2 u_0 & & \Delta^3 u_0 \\
u_5 & \Delta u_5 & & & \\
 & & \Delta^2 u_5 & & \\
u_{10} & \Delta u_{10} & & & \\
u_{15} & & & & \\
\vdots & & & &
\end{array}
$$

Abgeleitetes System

$u_0 \; \delta u_0 \; \delta^2 u_0$

$$
\left.
\begin{array}{l}
\delta^3 u_0 = 3d^3_{-5} \\
\delta^3 u_1 = 3d^3_{-5} \\
\delta^3 u_2 = 3d^3_{-5} \\
\delta^3 u_3 = -2d_0^3 \\
\delta^3 u_4 = -2d^3_{-5} \\
\delta^3 u_5 = 3d_0^3 \\
\delta^3 u_6 = 3d_0^3 \\
\delta^3 u_7 = 3d_0^3 \\
\delta^3 u_8 = -2d_5^3 \\
\delta^3 u_9 = -2d_0^3 \\
\delta^3 u_{10} = 3d_5^3 \\
\vdots
\end{array}
\right\} (c)
$$

woraus sich eine ungemein einfache Rechnungsregel zur Bestimmung der successiven $\delta^3 u$ ergiebt, aus denen sich wieder die übrigen Differenzen und die Werthe u selbst durch successive Addition bestimmen,

sobald nur die leitenden und einige weitere Differenzen der letzten Reihe, die eventuell nicht dem allgemeinen Bildungsgesetz folgen, ermittelt sind. Für diese kommt in Frage, ob das ursprüngliche System weiter zurückreicht, als das neue, oder ob beide Systeme mit demselben Werthe, u_0, beginnen. Im ersteren Falle hat man nach dem Vorangegangenen einfach

$$\left.\begin{aligned}\delta u_0 &= d_0 - 2d^2{}_{-5} - 2d^3{}_{-5}\\ \delta^2 u_0 &= d^2{}_{-5} - 2d^3{}_{-5}\end{aligned}\right\} \quad (d)$$

während $\delta^3 u_0$, $\delta^3 u_1 \ldots$ unverändert bleiben, im letzteren Falle dagegen muss man sich darüber schlüssig machen, welchem Gesetze die Interpolation in dem ersten Intervall zu folgen hat, für dass eine Oskulation im Anfangspunkte nicht eintreten kann. Lässt man mit Sprague für die erste Strecke diejenige Kurve gelten, nach der die Derivirten des ersten normalen Übergangspunktes zu bestimmen waren, so hat man hier, wo nur eine Derivirte berücksichtigt wurde, die betreffende Kurve 2ten Grades, und nur *ein* abnormes Intervall vorhanden ist, offenbar zu setzen:

$$\begin{aligned}\Delta^3 u_{-5} &= 0 & \qquad d^3{}_{-5} &= 0\\ \Delta^2 u_{-5} &= \Delta^2 u_0 & \qquad d^2{}_{-5} &= d_0{}^2\end{aligned}$$

und es verwandeln sich also die Gleichungen unter (d) nunmehr in

$$\left.\begin{aligned}\delta u_0 &= d_0 - 2d_0{}^2\\ \delta^2 u_0 &= d_0{}^2\end{aligned}\right\} \quad (d_1)$$

während der Anfang des Systems (c) selbst in

$$\left.\begin{array}{llll} u_0 & \delta u_0 & \delta^2 u_0 & \\ & & & \delta^3 u_0 = 0\\ & & & \delta^3 u_1 = 0\\ & & & \delta^3 u_2 = 0\\ & & & \delta^3 u_3 = -2d_0{}^3\\ & & & \delta^3 u_4 = 0\\ & & & \delta^3 u_5 = 3d_0{}^3 \end{array}\right\} \quad (c_1)$$

übergeht, was von $\delta^3 u_5$ an dem allgemeinen Bildungsgesetze entspricht.

Für das Ende der Interpolation verliert das System (c) abermals seine Gültigkeit, wenn die ursprüngliche Reihe nicht über die abzuleitende hinausreicht. Am zweckmässigsten ist es, nunmehr dasjenige Kurvenstück gelten zu lassen, welches durch die drei letzten Ordinaten u_n, u_{n-5}, u_{n-10} gelegt wurde und die Derivirte im Punkte $n-5$ bestimmte, was einfach geschieht, indem man das letzte in (c) vorkommende d^3 gleich Null setzt.

In derselben Weise, wie die Formel (2), kann auch die Sprague'sche Formel (1) und die Woolhouse'sche Formel (3) behandelt werden.

Für die Sprague'sche Formel erhält man, wenn alsbald angenommen wird, dass die Interpolation bis an die äussersten Werthe geführt werden soll, und man für den Anfang und das Ende der Rechnung die Sprague'schen Annahmen adoptirt:

$$
\left.\begin{array}{l}
\delta u_0 = d_0 - 2d_0^2 + 6d_0^3 - 21d_0^4 \\
\delta^2 u_0 = d_0^2 - 4d_0^3 + 16d_0^4 \\
\delta^3 u_0 = d_0^3 - 6d_0^4 \\
\delta^4 u_0 = d_0^4 \\
\hline
\delta^5 u_0 = \delta^5 u_1 = \ldots = \delta^5 u_5 = 0 \\
\delta^5 u_6 = 0.2 d_0^5 \\
\delta^5 u_7 = 0 \\
\delta^5 u_8 = -1.2 d_0^5 \\
\delta^5 u_9 = 0.6 d_0^5 \\
\hline
\delta^5 u_{10} = d_0^5 \\
\delta^5 u_{11} = 0.6 d_0^5 + 0.2 d_5^5 \\
\delta^5 u_{12} = -1.2 d_0^5 \\
\delta_5 u_{13} = -1.2 d_5^5 \\
\delta^5 u_{14} = 0.6 d_5^5 + 0.2 d_0^5 \\
\hline
\delta^5 u_{15} = d_5^5 \\
\vdots
\end{array}\right\} \quad (e)
$$

worin die letzten zwei $d^5, = 0$ zu setzen sind. Und für die Woolhouse'sche Formel ergiebt sich, wenn der Einfachheit halber voraus gesetzt wird, dass das ursprüngliche System über das alzuleitende nach beiden Seiten hinausreicht,

$$
\left.\begin{array}{l}
\delta u_0 = d_0 - 2d^2_{-5} \\
\hline
\delta^2 u_0 = d^2_{-5} \\
\delta^2 u_1 = 4d^2_{-5} - 3d_0^2 \\
\delta^2 u_2 = 4d_0^2 - 3d^2_{-5} \\
\delta^2 u_3 = d_0^2 \\
\delta^2 u_4 = d_0^2 \\
\hline
\delta^2 u_5 = d_0^2 \\
\delta^2 u^6 = 4d_0^2 - 3d_5^2 \\
\vdots
\end{array}\right\} \quad (f)
$$

woraus das Bildungsgesetz der successiven Differenzen δ^2 leicht zu erkennen ist. Das letzte System gestattet, beiläufig gesagt, eine etwas einfachere Rechnung, wenn man $\partial^2 u_1 = d^2_{-5} - 3\partial^3_{-5}$, $d^2 u_0 = d_0^2 + 3\partial^3_{-5}$ u. s. f. setzt, worin $\partial^3 = 5d^3 = \frac{\Delta^3}{5^2}$ ist.

Wenn man die von Sprague gegebenen Rechenvorschriften mit denjenigen vergleicht, die sich aus (*e*) ergeben, so wird man sofort die Vortheile der neuen Differenzenrechnung erkennen. Im Ubrigen galt es hier nur die theoretische Form der letzten Differenzenreihe δ^n für die verschiedenen Interpolationsformeln festzustellen und ich verlasse daher den Gegenstand, der keineswegs erschöpft ist, und noch manche interessante Seiten darbietet, indem ich mir vorbehalte, bei anderer Gelegenheit auf ihn zurückzukommen.

3. Die Ableitung der Ausgleichungsformeln.

In dem Differenzensysteme s ter Ordnung

$$\begin{array}{llll} u_0 & \delta u_0 & & \\ u_1 & \delta u_1 & \delta^2 u_0 & \ddots \\ u_2 & & & \delta^s u_0 \\ \vdots & & & \vdots \\ & & \delta^2 u_{n-2} & \ddots \ \delta^s u_{n-s} \\ u_n & \delta u_{n-1} & & \end{array}$$

erhält man die Differenzen $\delta^{s-1}u_1$, $\delta^{s-1}u_2$ . . . $\delta^{s-1}u_{n-s+1}$, indem man zu $\delta^{s-1}u_0$ erst $\delta^s u_0$, hierauf $\delta^s u_1$ legt u. s. f. bis alle Differenzen s^{ter} Ordnung benutzt sind. In derselben Weise kann man die $s-2^{\text{te}}$ Differenzenreihe aus der $s-1^{\text{ten}}$ ableiten und die Hauptreihe aus der Differenzenreihe δu_0, δu_1 . . . δu_{n-1}. Denkt man sich aber diese Rechnung über die Hauptreihe hinaus fortgesetzt, indem man zu einem willkürlichen Anfangswerte erst u_0, hierauf u_1, u. s. f.. hinzulegt, so entsteht eine neue Reihe, die man passend mit Σu_0, Σu_1, Σu_{n+1}, bezeichnen kann, wenn Σu_0 als willkürlicher Anfangswert betrachtet wird, und die offenbar in genau demselben Verhältniss zu u steht als u zu δu, so dass δ und Σ entgegengesetzte Operationen bedenten. Bildet man wiederum aus Σu_0, Σu_1 . . . Σu_{n-1} eine neue Reihe, indem man mit einem willkürlichen Anfangswerthe $\Sigma^2 u_0$ beginnt, zu diesem Σu_1, hierauf Σu_2 hinzufügt, u. s. f. und wiederholt man dieses Verfahren noch $r-2$ mal, so erhält man bei konsequenter Durchführung der Bezeichnungsweise schliesslich folgendes System.

$$\left.\begin{array}{llllllll} \Sigma^r u_0 & \Sigma^{r-1}u_0 & \ddots & \Sigma^2 u_0 & \Sigma u_0 & u_0 & \delta u_0 & \ddots \ \delta^s u_0 \\ \Sigma^r u_1 & \Sigma^{r-1}u_1 & \ddots & \Sigma^2 u_1 & \Sigma u_1 & u_1 & \delta u_1 & \ddots \ \delta^s u_1 \\ \Sigma^r u_2 & \Sigma^{r-1}u_2 & \ddots & \Sigma^2 u_2 & \Sigma u_2 & u_2 & \delta u_2 & \ddots \ \delta u_2 \\ \vdots & \vdots & & \vdots & \vdots & \vdots & & \delta^s u_{n-s} \\ & & & & & u_n & \delta u_{n-1} & \\ \Sigma^r u_{n+r} & \Sigma^{r-1}u_{n+r-1} & \ddots & \Sigma^2 u_{n+2} & \Sigma u_{n+1} & & & \end{array}\right\} (g)$$

das nach einer und derselben Regel gebildet ist und das nach Belieben als ein Differenzen- oder Summensystem $s+r^{\text{ter}}$ Ordnung bezeichnet werden kann. Beiläufig gesagt, ist, wenn die Anfangswerthe Σu_0, $\Sigma^2 u_0$ . . . $\Sigma^r u_0$, die man als Interpolationskonstanten ansehen kann, = O gesetzt werden

$$\Sigma u_{n+1} = u_0 + u_1 + u_2 + \ldots + u_n$$
$$\Sigma^2 u_{n+2} = (n+1)\,u_0 + n\,u_1 + (n-1)u_2 + \ldots + u_n$$
$$\Sigma^3 u_{n+3} = \frac{(n+2)\,(n+1)}{1\,.\,2}\,u_0 + \frac{(n+1)\,n}{1\,.\,2}\,u_1 + \frac{n\,(n-1)}{1\,.\,2}\,.\,u_2 + \ldots + u$$
$$\Sigma^r u_{n+1} = \frac{(n+r-1)\,(n+r-2)\ldots(n+1)}{1\,.\,2\ldots(r-1)}\,.\,u_0 + \frac{(n+r-2)\,(n+r-3)\ldots n}{1\,.\,2\ldots(r-1)}\,.\,u_1 + \frac{(n+r-3)\,(n+r-4)\ldots(n-1)}{1\,.\,2\ldots(r-1)}\,.\,u_2 + \ldots + u_n$$

so dass man die verschiedenen Σ nach einem einfachen Gesetz durch die Glieder der ursprünglichen Hauptreihe u_0, u_1 . . . ausdrücken kann.

Aus der Bildungsweise des Systems (g) folgt ohne Weiteres, dass

$$\delta\Sigma u_x = u_x$$
$$\delta^q\Sigma u_x = \delta^{q-1}u_x$$
$$\delta^q\Sigma^q u_x = u_x$$

was für die Folge von Wichtigkeit ist.

Wir führen nun ein neues System von Summen ein, indem wir setzen

$$\left.\begin{array}{l} u_0 + u_1 + \ldots + u_{k-1} = S_0 \\ u_1 + u_2 + \ldots + u_k = S_1 \\ \vdots \\ u + u_{x-1} + \ldots + u_{x+k-1} = S_x \\ \\ S_0 + S_1 + \ldots + S_{k-1} = S_0^{\,2} \\ S_1 + S_2 + \ldots + S_k = S_1^{\,2} \\ \vdots \\ S_x + S_{x+1} + \ldots + S_{x+k-1} = S_x^{\,2} \end{array}\right\} \quad (h)$$

u.s.f.

Man hat alsdann, wenn Δ sich auf das Intervall k bezieht,

$$S_0 = \Sigma u_k - \Sigma u_0 = \Delta\Sigma u_0$$
$$S_1 = \Sigma u_{k+1} - \Sigma u_1 = \Delta\Sigma u_1$$
$$\vdots$$
$$S_x = \Delta\Sigma u$$

und ferner

$$S_0^{\,2} = \Delta\Sigma u_0 + \Delta\Sigma u_1 + \ldots + \Delta\Sigma u_{k-1} = \Delta(\Sigma u_0 + \Sigma u_1 + \ldots + \Sigma u_{k-1}) = \Delta(\Sigma^2 u_k - \Sigma^2 u_0) = \Delta^2\Sigma^2 u_0$$
$$S_1^{\,2} = \Delta^2\Sigma^2 u_1$$
$$\vdots$$
$$S_x^{\,2} = \Delta^2\Sigma^2 u_x$$

und endlich allgemein

$$S_x^{\,q} = \Delta^q\Sigma^q u,$$

oder da, wie man leicht einsieht, die Operationen des Differenzirens und Summirens auch in umgekehrter Reihenfolge ausgeführt werden können

$$S_x^{\,q} = \Sigma^q\Delta^q u_x. \quad (i)$$

Darin bezieht sich, um es nochmals zu betonen, Δ auf das Intervall k, während Σ ebenso wie das entgegengesetzte δ sich auf das Intervall 1 beziehen.

Summen, wie die unter (k) sind uns schon aus den Higham'schen und Ackland'schen Untersuchungen bekannt und werden auch hier eine Rolle spielen. Wir führen sie daher für noch eine zweite, für manche Zwecke bequemere Bezeichnungsweise ein, indem wir setzen

$$\left.\begin{array}{l} u_{x-\xi}+u_{x-\xi+1}+\ \ldots\ +u_x+u_{x+1}+\ \ldots\ +u_{x+\xi}=\sigma \\ \sigma_{x-\xi}+\sigma_{x-\xi+1}+\ \ldots\ +\sigma_x+\sigma_{x+1}+\ \ldots\ +\sigma_{x+\xi}=\sigma^2 \\ \vdots \end{array}\right\} \quad (k)$$

und unter σ_ϕ, $\sigma_\phi{}^2$, . . . diejenigen Summen verstehen, die in derselben Weise zusammengesetzt sind als σ, σ^2, . . . , in denen aber alle Indices um ϕ höher sind, sodass der Index des mittleren Gliedes $x+\phi$ ist. Zwischen den neuen und früheren Summen bestehen alsdann, wenn wir annehmen, dass $\xi=\frac{k-1}{2}$ ist, die Beziehungen

$$\left.\begin{array}{l} \sigma\ =\mathrm{S}_{x-\frac{k-1}{2}} \\ \sigma^2=\mathrm{S}^2_{(x-k-1)} \\ \vdots \\ \sigma\ =\mathrm{S}^q_{x-q\,.\,\frac{k-1}{2}} \end{array}\right\} \quad (l)$$

von denen in der Folge Gebrauch gemacht werden wird.

Wir kehren nunmehr zu unserem Ausgleichungsproblem zurück. Anstatt das Woolhouse'sche Princip direkt anzuwenden und aus fünf, durch Interpolation gewonnenen Tafeln das Mittel zu nehmen, kann man offenbar auch aus den Differenzen 1ster, 2ter oder einer anderen Ordnung das Mittel nehmen und die definitive Tafel durch successive Aufsummirung der somit erlangten neuen Differenzen gewinnen, das Resultat muss in beiden Fällen dasselbe sein. Aus diesem Zusammenhang ergiebt sich nun ein einfaches Verfahren, nach dem man aus jeder vorgelegten Interpolationsformel alsbald die entsprechende Ausgleichungsformel nach Woolhouse'schem Princip ableiten kann und die letztere zugleich eine Förm annimmt, die sich vorzüglich für die praktische Rechnung eignet. Es soll dieses Verfahren zunächst an der Woolhouse'schen Interpolationsformel erläutert werden.

Es seien . . . u_{-2}, u_{-1}, u_0, u_1, u_2 . . . die auszugleichenden Werthe, von denen . . . u_{-5}, u_0, u_5 . . . für die erste, . . . u_{-4}, u_1, u_6 . . . für die zweite Interpolation, u.s.f. zur Verwendung kommen. Alsdann hat man als 3te Differenzen der verschiedenen Kurven zufolge (f)

1ste Kurve.	2te Kurve.	3te Kurve.
⋮		
$\delta^2u_0=d^2{}_{-5}$	⋮	
$\delta^2u_1=4d^2{}_{-5}-3d_0{}^2$	$\delta^2u_1=d^2{}_{-4}$	⋮
$\delta^2u_2=4d_0{}^2-3d^2{}_{-5}$	$\delta^2u_2=4d^2{}_{-4}-3d_1{}^2$	$\delta^2u_2=d^2{}_{-3}$
$\delta^2u_3=d_0{}^2$	$\delta^2u_3=4d_1{}^2-3d^2{}_{-4}$	$\delta^2u_3=4d^2{}_{-3}-3d_2{}^2$
$\delta^2u_4=d_0{}^2$	$\delta^2u_4=d_1{}^2$	$\delta^2u_4=4d_2{}^2-3d^2{}_3$
$\delta^2u_5=d_0{}^2$	$\delta^2u_5=d_1{}^2$	$\delta^2u_5=d_2{}^2$
$\delta^2u_6=4d_0{}^2-3d^2{}_{-5}$	$\delta^2u_6=d_1{}^2$	$\delta^2u_6=d_2{}^2$
⋮	⋮	⋮

4te Kurve.	5te Kurve.
⋮	
$\delta^2 u_3 = d^2_{-2}$	⋮
$\delta^2 u_4 = 4d^2_{-2} - 3d_3{}^2$	$\delta^2 u_4 = d^2_{-1}$
$\delta^2 u_5 = 4d_3{}^2 - 3d^2_{-2}$	$\delta^2 u_5 = 4d^2_{-1} - 3d_4{}^2$
$\delta^2 u_6 = d_3{}^2$	$\delta^2 u_6 = 4d_4{}^2 - 3d^2_{-1}$
⋮	⋮

und als das der definitiven, ausgeglichenen Tafel angehörende $\delta^2 u_3$, das zum Unterschiede mit $\delta^2 (u)_3$ bezeichnet sein mag,

$$\delta^2(u)_3 = \frac{1}{5} \cdot [d_0{}^2 + d_1{}^2 + (4d_2{}^2 - 3d^2_{-3}) + (4d^2_{-2} - 3d_3{}^2) + d^2_{-1}]$$

$$= \frac{1}{5} \cdot (-3d^2_{-3} + 4d^2_{-2} + d^2_{-1} + d_0{}^2 + d_1{}^2 + 4d_2{}^2 - 3d_3{}^2)$$

Für jede Differenz δ^2 der ausgeglichenen Tafel muss aber dasselbe Bildungsgesetz bestehen, wovon man sich auch an der Hand des vorstehenden Schema's überzeugen könnte, und man wird daher ganz allgemein haben, indem man alle Indices um $x-3$ erhöht und zugleich beachtet, dass d^2 für $\frac{\Delta^2 u}{5^2}$ gesetzt ist,

$$\delta^2(u)_x = \frac{1}{5^3} \cdot (-3\Delta^2 u_{x-7} + 4\Delta^2 u_{x-6} + \Delta^2 u_{x-5} + \Delta^2 u_{x-4} + \Delta^2 u_{x-3} + 4\Delta^2{}_{x-2} - 3\Delta^2{}_{x-1})$$

Um von $\delta^2(u)_x$ auf u_x selbst zukommen, bedarf es nur einer zweimaligen Summation oder was dasselbe ist, Integration nach dem Intervall 1 von x, was zufolge (g) geschieht, indem man allen Gliedern Σ^2 vorsetzt und auf der einen oder anderen Seite der Gleichung zwei Integrationskonstanten, von denen die eine mit x verbunden ist, hinzufügt. Lassen wir diese Korrektion einstweilen bei Seite, so ist also

$$(u)_x = \Sigma^2\delta^2(u)_x = \frac{1}{5^3} \cdot (-3\Sigma^2\Delta^2 u_{x-7} + 4\Sigma^2\Delta^2 u_{x-6} + \ldots - 3\Sigma^2\Delta^2{}_{x-1})$$

oder mit Rücksicht auf Gleichung (i),

$$(u)_x = \frac{1}{5^3} \cdot (3S^2{}_{x-7} + 4S^2{}_{x-6} + S^2{}_{x-5} + S^2{}_{x-4} + S^2{}_{x-3} + 4S^2{}_{x-2} - 3S^2{}_{x-1})$$

Die Grössen S^2 setzen sich — wie allgemein auch S^q symmetrisch und linear aus den (unausgeglichenen) Werthen u zusammen, umfassen für jedes beliebige x immer eine gleiche endliche Anzahl von u und müssen nothwendig verschwinden, sobald die zugehörigen u in O übergehen. Dieselben Eigenschaften kommen aber offenbar auch den ausgeglichenen u, den Grössen (u) zu, und es kann daher in Wirklichkeit in der vorstehenden Gleichung weder eine einfache Konstante, noch eine mit x verbundene Konstante fehlen. Beachtet man noch, dass die Glieder in der Klammer ( ) sich durch

$$-3(S^2{}_{x-7} + S^2{}_{x-6} + S^2{}_{x-5} + S^2{}_{x-4} + S^2{}_{x-3}) + 7 \cdot (S^2{}_{x-6} + S^2{}_{x-5} + S^2{}_{x-4} + S^2{}_{x-3} + S^2{}_{x-2}) - 3(S^2{}_{x-5} + S^2{}_{x-4} + S^2{}_{x-3} + S^2{}_{x-2} + S^2{}_{x-1})$$

oder mit Rücksicht auf (*h*) und weil hier $k=5$ ist, durch

$$-3S^3_{x-7}+7S^3_{x-6}-3S^3_{x-5}$$

wiedergeben lassen, und dass andererseits für $k=5$ oder $\frac{k-1}{2}=2$ zufolge (*l*)

$$\sigma^3=S^3_{x-3.2}=S^3_{x-6},$$
$$S^3_{x-7}=\sigma^3_{-1},\ S^3_{x-5}=\sigma_1{}^3,$$

so gewinnt man schliesslich die Formel

$$(u)=\frac{10\sigma^3-3(\sigma^3_{-1}+\sigma^3+\sigma_1{}^3)}{125} \qquad (4)$$

womit die Woolhouse'sche Ausgleichung auf eine bekannte, von Higham gefundene einfache Rechnungsregel (*J.I.A.* vol. xxxi. p. 319 und ff.) zurückgeführt ist.

Wendet man das dargelegte Verfahren auf die neue Interpolationsformel (2) bez. das Schema (*c*) an, so ergiebt sich

$$(u)=\frac{0.6(\sigma_{-1}{}^3+\sigma^3+\sigma_1{}^3)-0.4(\sigma^3_{-3}+\sigma_3{}^3)}{5^3}$$

oder

$$(u)=0.0016\,.[3(\sigma^3_{-1}+\sigma^3+\sigma_1{}^3)-2(\sigma^3_{-3}+\sigma_3{}^3)] \qquad (5)$$

während das Schema (*c*) das sich auf die Sprague'sche oskulirende Interpolation bezieht, zu der Formel führt

$$(u)=\frac{\sigma^5+0.6(\sigma^5_{-1}+\sigma_1{}^5)-1.2(\sigma^5_{-2}+\sigma_2{}^5)+0.2(\sigma^5_{-4}+\sigma_4{}^5)}{5^4} \qquad (6)$$

Die Formel (5) ist diejenige, die sich meiner Ansicht nach ganz besonders für mechanische Ausgleichungen eignet, bei denen es auf Regelmässigkeit der Resultate ankommt. Inwieweit sie diese Aufgabe erfüllt, werden die folgenden Abschnitte zeigen.

Interessant ist es, dass auch die Formel, welche Higham in erster Linie für mechanische Ausgleichungen empfiehlt (Vergl. unter Anderem den schon herangezogenen Aufsatz im (*J.I.A.* vol. xxxi.) und die auf einer ganz anderen theoretischen Basis beruht, sich durch die Grossen σ, die sich hier überall auf eine Zusammenfassung zu je 5 Werthen beziehen, ausdrücken lässt. Versteht man nämlich mit Higham unter $Sp.\ q.\ r.$ eine Summe, welche entsteht, wenn aus einer Reihe aufeinanderfolgender Glieder zuerst je p, aus der neu entstehenden Reihe dann je q, von dieser wiederum je r zusammengefasst werden u.s.f., so lautet die betreffende Formel

$$(u)=\frac{3\,S_{5\cdot5\cdot5\cdot4\cdot2}-3\,S_{5\cdot5\cdot5\cdot5}}{125}$$

Es ist aber

$$S_{5\cdot5\cdot5\cdot5}=\sigma^3+\sigma_1{}^3+\sigma_{-1}{}^3+\sigma_2{}^3+\sigma_{-2}{}^3$$
$$S_{5\cdot5\cdot5\cdot4\cdot2}=2\sigma^3+2\sigma_1{}^3+2\sigma_{-1}{}^3+\sigma_2{}^3+\sigma_{-2}{}^3$$

und man hat daher auch

$$(u)=0{\cdot}08\,.\left[(\sigma_1{}^3+\sigma^3+\sigma_1{}^3)-(\sigma_{-2}{}^3+\sigma_2{}^3)\right] \quad . \quad . \quad . \quad (7)$$

Die Formel wird in der Folge Verwendung finden und kurz als die Higham'sche bezeichnet werden.

4. Die Ergebnisse der Ausgleichungs-Formeln.

Es versteht sich von selbst, dass die Ergebnisse einer Ausgleichungsformel umso regelmässiger ausfallen können, je mehr Beobachtungen sie umfasst. Aber die Zahl der Glieder giebt doch nicht allein den Ausschlag, viel hängt auch von der Art und Weise ab, in welcher die Beobachtungen zur Geltung kommen. Am besten wird unter sonst gleichen Umständen die Formel ebnen, in welcher die Koëfficienten, welche den Originalbeobachtungen zukommen, eine wenig gekrümmte, im Auf- und Absteigen fast gradlinige Kurve darstellen, die an den Punkten, wo Windungen unvermeidlich sind, möglichst flach und glatt verläuft, weil die einzelne Beobachtung mit fortschreitender Rechnung successive alle Koëfficienten als Faktor erhält und eine Unregelmässigkeit offenbar umso weniger stören wird, je allmählicher sie ins Gewicht fällt und je gleichmässiger sie auf eine grössere Strecke vertheilt wird. Diesen Zusammenhang zuerst erkannt und verwerthet zu haben, ist das besondere Verdienst Higham's, dessen Ausgleichungsformeln viel ebenmässigere Resultate liefern als die Woolhouse'sche, in theoretischer Hinsicht aber dieser nachstehen.

Es unterliegt keinen Schwierigkeiten, die von uns abgeleiteten Ausgleichungsformeln (5) und (6) auf die auszugleichenden Grössen selbst zurückzuführen. Die Summe σ setzt sich für $k=5$, was hier allein in Frage kommt, aus u_{-2}, u_{-1}, u_0, u_1, u_2 zusammen und liefert die Koëfficienten

$$1 \quad 1 \quad 1 \quad 1 \quad 1$$

während aus σ^2 die Koëfficienten

$$1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 4 \quad 3 \quad 2 \quad 1$$

und aus σ^3 die Koëfficienten

$$1 \quad 3 \quad 6 \quad 10 \quad 15 \quad 18 \quad 19 \quad 18 \quad 15 \quad 10 \quad 6 \quad 3 \quad 1$$

hervorgehen. Berücksichtigt man, dass σ_ϕ dieselben Koëfficienten, aber für einen um ϕ verschobenen Index hat, so gelangt man, indem man die in (5) und (6) angedeutete Multiplikation mit 0·0016 bez. die Division mit 5^4 wirklich ausführt, zu den Gleichungen

$$\begin{aligned}(u) = {} & 0{\cdot}2000u_0 + 0{\cdot}1824u_1 + 0{\cdot}1392u_2 + 0{\cdot}0848u_3 + 0{\cdot}0336u_4 \\ & - 0{\cdot}0128u_6 - 0{\cdot}0144u_7 - 0{\cdot}0096u_8 \\ & - 0{\cdot}0032u_9 + \ldots \quad \ldots \quad \ldots \quad \ldots \quad (5a)\end{aligned}$$

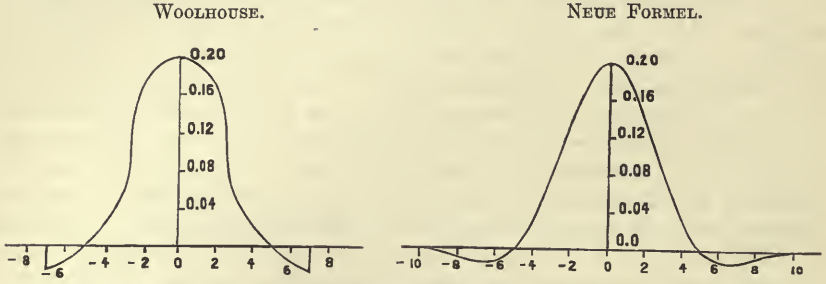
und

$$\begin{aligned}(u) = {} & 0{\cdot}20000u_0 + 0{\cdot}18688u_1 + 0{\cdot}14528u_2 + 0{\cdot}08768u_3 + 0{\cdot}03488u_4 \\ & - 0{\cdot}01952u_6 - 0{\cdot}02272u_7 - 0{\cdot}01472u_8 - 0{\cdot}00512u_9 \\ & + 0{\cdot}00256u_{11} + 0{\cdot}00288u_{12} + 0{\cdot}00160u_{13} \\ & + 0{\cdot}00032u_{14} + \ldots \quad \ldots \quad \ldots \quad \ldots \quad (6a)\end{aligned}$$

von denen die erste sich auf die Ausgleichungsformel (5), die zweite auf

(6) bezieht. Die weggelassenen Glieder haben durchgängig negative Indices und entsprechen genau den Gliedern mit positivem Index.

Stellt man die Koëfficienten von (5*a*) sowie die Woolhouse'schen graphisch dar, so erkennt man sofort, dass die neuen den Vorzug verdienen. Die Woolhouse'sche Kurve setzt mit einem Sprunge bei dem Index



7 ein und ist bauchig, oder wie Higham sich ausdrückt, hochschulterig, wodurch die Beobachtungen von einem ausgeglichenen Werthe zum anderen ein rasch wechselndes Gewicht bekommen, die neue Kurve dagegen steigt und fällt in dem wichtigeren Theile fast gleichmässig und schmiegt sich im Anfange und am Ende der Abscisse tangentenmässig an.

Am deutlichsten tritt das in den Koëfficienten liegende Gesetz hervor, wenn man Differenzen 1ster und höherer Ordnung in Betracht zieht und ich gebe daher noch eine einschlägige Zusammenstellung, in der die Higham'sche Formel mit berücksichtigt ist.

Tab. 1.—Koëfficienten verschiedener Ausgleichungsformeln und deren Differenzen.

Index	Woolhouse	δ	δ^2		Higham	δ	δ^2	δ^3
		80				80		240
0	0·2000		−160		0·2000		−160	
		− 80				− 80		−240
1	0·1920		−160		0·1920		−400	
		− 240				−480		240
2	0·1680		−880		0·1440		−160	
		−1120				−640		240
3	0·0560		800		0·0800		80	
		− 320				−560		260
4	0·0240		80		0·0240		340	
		− 240				−240		−260
5	0·0000		80		0·0000		80	
		− 160				−160		80
6	−0·0160		240		−0·0160		160	
		80				0		− 80
7	−0·0240		160		−0·0160		80	
		240				80		− 80
8			−240		−0·0080		0	
						80		− 80
9							−80	
								80
10								
11								

Index		Formel (5) δ	δ²	δ³		Formel (6) δ	δ²	δ³
		176		− 96		131,2		22,4
0	0·2000		− 352		0·2000,0		− 262,4	
		−176		96		−131,2		− 22,4
1	0·1824		− 256		0·1868,8		− 284,8	
		− 432		144		−416,0		124,8
2	0·1392		− 112		0·1452,8		− 160,0	
		−544		144		−576,0		208,0
3	0·0848		32		0·0876,8		48,0	
		−512		144		−528,0		131,2
4	0·0336		176		0·0348,8		179,2	
		−336		32		−348,8		− 25,6
5	0·0000		208		0		153,6	
		−128		− 96		−195,2		9,6
6	−0·0128		112		−0·0195,2		163,2	
		· 16		− 48		− 32,0		− 51,2
7	−0·0144		64		−0·0227,2		112,0	
		48		− 48		80,0		− 96,0
8	−0·0096		16		−0·0147,2		16,0	
		64		− 48		96,0		− 60,8
9	−0·0032		− 32		−0·0051,2		− 44,8	
		32		0		51,2		19,2
10			− 32		0		− 25,6	
				32		25,6		3,2
11					0·0025,6		− 22,4	
						3,2		6,4
12					0·0028,8		− 16,0	
						− 12,8		16,0
13					0·0016,0		0	
						− 12,8		9,6
14					0·0003,2		9,6	
						− 3,2		− 6,4
							3,2	
								− 3,2

Die Higham'sche Formel ist hiernach entschieden besser als die Woolhouse'sche, Formel (5) und Formel (6) aber wieder besser als diese. Da es von Vortheil ist, wenn auch die Differenzen höherer Ordnung möglichst flach verlaufen, so muss Formel (5) noch stärker ebnen als Formel (6), was angesichts der grösseren Zahl der Glieder der letzteren einigermaassen überrascht.

Um die Brauchbarkeit der neuen Formel (5) an einem praktischen Beispiele darzulegen, habe ich die $H^{M(5)}$ Tafel sowohl nach dieser als der Higham'schen Formel ausgeglichen. Die Resultate, die als überaus befriedigende bezeichnet werden können, sind in der nachstehenden Tabelle 3 eingetragen, die auch die Woolhouse'schen Zahlen wiedergiebt. Bemerkt muss werden, dass die letzteren dem Werke: 'Institute of Actuaries' Life Tables (London, 1872)' entnommen sind, in welchem gewisse auffällige Unregelmässigkeiten bereits künstlich beseitigt sein sollen und dass den neuen Ausgleichungen nicht die Zahlen den Lebenden, sondern die Sterblichkeitsprocentsätze zu Grunde gelegt sind. Die Rechnung selbst ist durch das als Tab. 2 vorausgeschickte Bruchstück erläutert.

TAB. 2.—BRUCHSTÜCK AUS DER AUSGLEICHUNG NACH FORMEL (5).

$(H^{M\,(5)})$

Alter	Unausgeglichener Sterblichkeitsprocentsatz	HUNDERTFACHES VON					Differenz der beiden letzten Kol. ×0·0016 oder ausgegl. Sterblichkeitsprocentsatz
		σ^1	σ^2	σ^3 (um eine Decimale gekürzt)	$3\cdot(\sigma_{-1}{}^3+\sigma^3+\sigma_1{}^3)$	$2\cdot(\sigma_{-3}{}^3+\sigma_3{}^3)$	
20	0·51						
21	0·90						
22	1·11	4·69					
23	1·71	5·24					
24	0·46	5·46	25·34				
25	1·06	5·42	25·66				
26	1·12	4·53	25·42	125·1			
27	1·07	5·01	24·75	123·7	1111·5		
28	0·82	5·00	23·88	121·7	1094·7		
29	0·94	4·79	23·97	119·5	1077·3	486·0	0·946
30	1·05	4·55	23·68	117·9	1065·0	485·4	0·927
31	0·91	4·62	23·22	117·6	1060·2	487·0	0·917
32	0·83	4·72	23·14	117·9	1063·5	490·0	0·918
33	0·89	4·54	23·59	119·0	1076·1	494·6	0·930
34	1·04	4·71	24·23	121·8	1098·9		
35	0·87	5·00	24·86	125·5	1130·1		
36	1·08	5·26	25·94	129·4			
37	1·12	5·35	26·85				
38	1·15	5·62	27·50				
⋮							

TAB. 3.—AUSGEGLICHENE STERBLICHKEITSPROCENTSÄTZE NACH WOOLHOUSE, HIGHAM UND FORMEL (5) FÜR DIE $H^{M\,(5)}$ TAFEL. (δ UND δ^2 GEBEN DIE 1STEN UND 2TEN DIFFERENZEN.)

Alter	WOOLHOUSE unter Zugrundelegung der Lebenden in der Dekremententafel			HIGHAM unter Zugrundelegung von q_x			NEUE FORMEL unter Zugrundelegung von q_x		
	$100\,(q)_x$	δ	δ^2	$100\,(q)_x$	δ	δ^2	$100\,(q)_x$	δ	δ^2
19	0·672			0·681			0·688		
		16 1			15 6			13 9	
20	0·833		− 2 8	0·837		− 3 8	0·827		− 2 2
		13 3			11 8			11 7	
21	0·966		− 7 1	0·955		− 4 3	0·944		− 3 7
		6 2			7 5			8 0	
22	1·028		− 1 9	1·030		− 4 3	1·024		− 4 0
		4 3			3 2			4 0	
23	1·071		− 3 2	1·062		− 1 4	1·064		− 3 6
		1 1			1 8			4	
24	1·082		− 4 2	1·080		− 4 9	1·068		− 2 1
		− 3 1			− 3 1			− 1 7	
25	1·051		− 1 4	1·049		− 3	1·051		− 1 1
		− 4 5			− 3 4			− 2 8	
26	1·006		3 3	1·015		9	1·023		− 2
		− 1 2			− 2 5			− 3 0	
27	0·994		− 1 2	0·990		1 1	0·993		5
		− 2 4			− 1 4			− 2 5	
28	0·970		0	0·976		− 1 9	0·968		3
		− 2 4			− 3 3			− 2 2	
29	0·946		− 2	0·943		1 3	0·946		3
		− 2 6			− 2 0			− 1 9	
30	0·920		2 3	0·923		1 6	0·927		9
		− 3			− 4			− 1 0	

TAB. 3—*Fortsetzung.*

Alter	WOOLHOUSE unter Zugrundelegung der Lebenden in der Dekremententafel			HIGHAM unter Zugrundelegung von q_x			NEUE FORMEL		
	$100\,(q)_x$	δ	δ^2	$100\,(q)_x$	δ	δ^2	$100\,(q)_x$	δ	δ^2
31	0·917		12	0·919		4	0·917		11
		9			0			1	
32	0·926		−12	0·919		6	0·918		11
		−3			6			12	
33	0·923		23	0·925		21	0·930		14
		20			27			26	
34	0·943		37	0·952		17	0·956		12
		57			44			38	
35	1·000		−22	0·996	−	3	0·994		3
		35			41			41	
36	1·035		0	1·037	−	5	1·035	−	4
		35			36			37	
37	1·070		2	1·073	−	7	1·072	−	10
		37			29			27	
38	1·107		−25	1·102	−	10	1·099	−	9
		12			19			18	
39	1·119		1	1·121	−	12	1·117	−	6
		13			7			12	
40	1·132		−13	1·128		4	1·129	−	1
		0			11			11	
41	1·132		26	1·139		7	1·140		7
		26			18			18	
42	1·158		0	1·157		10	1·158	−	11
		26			28			29	
43	1·184		15	1·185		15	1·187		16
		41			43			45	
44	1·225		28	1·228		19	1·232		14
		69			62			59	
45	1·294		3	1·290		12	1·291		13
		72			74			72	
46	1·366		2	1·364		5	1·363		10
		74			79			82	
47	1·440		18	1·443		11	1·445		5
		92			90			87	
48	1·532		3	1·533		0	1·532		0
		95			90			87	
49	1·627		−10	1·623	−	6	1·619	−	1
		85			84			86	
50	1·712		3	1·707	−	1	1·705		1
		88			83			87	
51	1·800		−10	1·790		11	1·792		4
		78			94			91	
52	1·878		35	1·884		5	1·883		9
		113			99			100	
53	1·991		−10	1·983		11	1·983		12
		103			110			112	
54	2·094		22	2·093		14	2·095		9
		125			124			121	
55	2·219		7	2·217		11	2·216		12
		132			135			133	
56	2·351		25	2·352		8	2·349		14
		157			143			147	
57	2·508		−7	2·495		18	2·496		16
		150			161			163	
58	2·658		28	2·656		27	2·659		22
		178			188			185	
59	2·836		50	2·844		23	2·844		27
		228			211			212	
60	3·064		0	3·055		27	3·056		28
		228			238			240	
61	3·292		38	3·293		31	3·296		29
		266			269			269	
62	3·558		26	3·562		26	3·565		19
		292			295			288	
63	3·850		29	3·857		5	3·853		11
		321			300			299	
64	4·171		31	4·157		4	4·152		4
		290			304			303	
65	4·461		33	4·461		0	4·455	−	2
		323			304			301	
66	4·784		−11	4·765		4	4·756		5
		312			308			306	
67	5·096		37	5·073		10	5·062		33
		349			318			339	
68	5·445		18	5·391		83	5·401		64
		367			401			403	
69	5·812		105	5·792		95	5·804		99
		472			496			502	

Tab. 3—*Fortsetzung.*

Alter	Woolhouse unter Zugrundelegung der Lebenden in der Dekremententafel			Higham unter Zugrundelegung von q_x			Neue Formel unter Zugrundelegung von q_x		
	$100\,(q)_x$	δ	δ^2	$100\,(q)_x$	δ	δ^2	$100\,(q)_x$	δ	δ^2
70	6·284	572	100	6·288	623	127	6·306	612	110
71	6·856	699	127	6·911	703	80	6·918	705	93
72	7·555	793	94	7·614	788	85	7·623	760	55
73	8·348	875	82	8·402	776	−12	8·383	777	17
74	9·223	726	−149	9·178	772	−4	9·160	776	−1
75	9·949	861	135	9·950	77	−2	9·936	794	18
76	10·81	74	−121	10·72	85	8	10·73	85	56
77	11·55	91	17	11·57	94	9	11·58	95	10
78	12·46	103	12	12·51	107	13	12·53	107	12
79	13·49	109	6	13·58	119	12	13·60	118	11
80	14·58	129	20	14·77	127	8	14·78	128	10
81	15·87	136	7	16·04	134	7	16·06	130	2
82	17·23	135	−1	17·38	127	−7	17·36	121	−9
83	18·58	132	−3	18·65	105	−22	18·57	97	−24
84	19·90	111	−21	19·70	66	−39	19·54	87	−10
85	21·01	98	−13	20·36	96	30	20·41	100	13
86	21·99	129	31	21·32	135	39	21·41	114	14
87	23·28			22·67			22·55		

Die Formel (6) eignet sich nicht für Ausgleichungszwecke, da sie entschieden zu komplicirt gebaut ist. Auch zieht sie sehr entfernte Glieder in Betracht, worin Manche einen Ubelstand erblicken dürften, obwohl die Koëfficienten der entfernten Glieder sehr klein sind. Zieht man die Koëfficienten nur mit ihrem absoluten Werthe in Betracht, so beträgt die Summe derselben

Index	bei der Woolhouse'schen, Higham'schen und neuen Formel (5) übereinstimmend	%	bei der Formel (6)	%
0	0·2000	93·1	0·2000	88·9
− 1 bis − 4 und 1 bis 4	0·8800		0·9094,4	
− 5 bis − 9 und 5 bis 9	0·0800	6·9	0·1241,6	9·9
−10 bis −14 und 10 bis 14			0·0147·2	1·2
	1·1600	100·0	1.2483·2	100·0

und es fallen demnach bei allen Formeln fast ausschliesslich die mittleren neun Beobachtungen in's Gewicht.

5. Der theoretische Fehler.

Es ist schon öfters erörtert worden, welche Funktion sich am besten zur Ausgleichung eigne, die Zahlen der Lebenden in der Dekremententafel oder die Sterbenswahrscheinlichkeiten. Woolhouse entschied

sich für die Zahlen der Lebenden, weil diese sich angeblich leichter behandeln liessen und es bei seiner Methode von Vortheil sei, den Schluss der (unausgeglichenen) Tafel in Null auslaufen zu lassen, Sprague und alle Diejenigen, welche in graphischer Weise ausgleichen, benutzen dagegen die Sterbenswahrscheinlichkeiten oder, was auf dasselbe hinausläuft, die Sterblichkeitsprocentsätze, bei denen am ehesten eine Berücksichtigung der Gewichte der einzelnen Beobachtungen stattfinden kann.

Nach meiner Ansicht hängt die Frage, insoweit mechanische Ausgleichungen in Betracht kommen, in erster Linie davon ab, welche Funktion den kleinsten theoretischen Fehler befürchten lässt. Bekanntlich lassen sich weder die Lebenden, noch die Sterbenswahrscheinlichkeiten für grössere Strecken durch parabolische Kurven darstellen und gleichwohl setzt jede mechanische Ausgleichung eine solche voraus und weicht damit theoretisch von der wahren Kurve (*ab*). Ein zweiter Gesichtspunkt wäre der, ob bei der einen oder anderen Funktion nicht eine grössere Regelmässigkeit erzielt werden kann und hier scheint Manches für die Zahlen der Lebenden zu sprechen, weil jede Interpolation derselben schon eine gewisse Ausgleichung der innerhalb Der Intervalle liegenden Sterbenswahrscheinlichkeiten mit sich bringt. Allein der Vortheil geht, wenn alle Punkte gleichmässig behandelt und entsprechende Durchschnitte gezogen werden, unbedingt wieder verloren, wie man schon daran erkennen kann, dass die Woolhouse'sche Formel fast dieselben Resultate liefert, wenn sie auf die Sterbenswahrscheinlichkeiten, als wenn sie auf die Zahlen der Lebenden angewandt wird, und es kann daher jener Gesichtspunkt bei Seite gelassen werden.

Um die erste Frage zu lösen, empfiehlt es sich, die eine oder andere Ausgleichungsformel an einer Tafel zu versuchen, die bereits einem analytischen Gesetze genügt und in ihrem ganzen Verlauf einen normalen Charakter aufweist. Ich habe einige einschlägige Untersuchungen angestellt und zwar an der nach der Gompertz-Makeham'schen Formel ausgeglichenen H^M Tafel des Text Book (Part II, p. 88), die schon Sprague für einen ähnlichen Zweck benutzt hat. Der Vergleich wird etwas beeinträchtigt dadurch, dass die (erneute) Ausgleichung der Lebenden nach der Woolhouse'schen, die der Sterbenswahrscheinlichkeiten und ihrer Logarithmen nach der Formel (5) erfolgt ist, und man muss daher im Auge behalten, dass, wie später bewiesen werden soll, der theoretische Fehler bei der Woolhouse'schen Formel ein wenig geringer ist, als nach der anderen.

Wie man sieht, führt die Ausgleichung der Lebenden in den meisten Altersklassen zu grösseren Fehlern, als die der Sterbenswahrscheinlichkeiten, sowohl in den letzteren selbst als in den rechnungsmässigen Zahlen der Sterbefälle. Nur die Gesammtzahl der Sterbefälle fällt bei jener Grundlage etwas genauer aus, worauf indess wenig ankommt, da eine Verschiebung in den Lebenden unter Risiko das Ergebniss ganz abändern könnte und der Anschluss im Allgemeinen am besten nach der Summe der absoluten Werthe der Abweichungen beurtheilt wird. Diese Summe stellt sich aber für die "Lebenden" auf 9·73 und für die Sterbenswahrscheinlichkeiten auf 5·57 und es dürfte damit endgültig entschieden sein, dass die letzteren in der That die bessere Grundlage für mechanische Ausgleichungen abgeben.

TAB. 4.—ERNEUTE AUSGLEICHUNG DER NACH DER GOMPERTZ-MAKEHAM'SCHEN FORMEL BERECHNETEN H^M TAFEL DES TEXT-BOOK.

Unter q_x ist die Sterbenswahrscheinlichkeit des Text-Book, unter $q_x^{(1)}$ die neue Sterbenswahrscheinlichkeit zu verstehen.

Alter		5 jährige Durschnitte der Werthe von 10,0000 $(q_x^{(1)} - q_x)$ wenn die neue Ausgleichung ausgeführt wird		
		nach Woolhouse	nach Formel (5) unter Zugrundelguug der	
		Dekremententafel der Lebenden (l_x)	Sterblichkeits-procentsätze $100q_x$	Log. der Sterblich-keitspromillesätze log. $1000q_x$
10–14				
15–19				
20–24				
25–29			0·1	
30–34		0·2	0·1	
35–39		0·0	0·2	
40–44		0·0	0·3	−0·1
45–49		−0·2	0·4	−0·1
50–54		−0·2	0·6	−0·1
55–59		−1·0	0·9	−0·1
60–64		−1·8	1·2	0·0
65–69		−2·4	1·6	0·0
70–74		0·2	1·8	0·0
75–79		17·4	1·3	0·1
80–84		60·2	−1·0	0·4
85–89		26·6	−6·6	1·0
90–94		−1322·8	−13·7	1·5
95, 96		−7365	−13·8	1·2
	Lebende unter Risiko der H^M Tafel	Vorige Zahlen multiplicirt mit den nebenstehenden Lebenden unter Risiko		
10–14	2613·5			
15–19	7682·5			
20–24	33739			
25–29	95557		0·10	
30–34	155062	0·31	0·16	
35–39	185936	0·00	0·37	
40–44	185519	0·00	0·56	−0·19
45–49	162181·5	−0·32	0·65	−0·16
50–54	130785·5	−0·26	0·78	−0·13
55–59	97301	−0·97	0·88	−0·10
60–64	66495	−1·20	0·80	0·00
65–69	40664·5	−0·98	0·65	0·00
70–74	21952·5	0·04	0·40	0·00
75–79	9582·5	1·67	0·12	0·01
80–84	3189·5	1·92	−0·03	0·01
85–89	716	0·19	−0·05	0·01
90–94	110	−1·46	−0·02	0·00
95, 96	5·5	−0·41	0·00	0·00
Summe		−1·47	5·37	−0·55
Summe ohne Rücksicht auf das Zeichen der Abweidungen		9·73	5·57	0·61

Einen geradezu ausgezeichneten Anschluss zeigt die auf der Basis der Logarithmen ausgeführte Ausgleichung, die Differenzen sind hier in allen Altersklassen minimal und die Gesammtabweichung in den rechnungsmässigen Zahlen der Sterbefälle beträgt, je nachdem das Zeichen der Einzelabweichung berücksichtigt wird oder nicht, nur

$-0{\cdot}55$ oder $0{\cdot}61$. Das Ergebniss lässt sich im Allgemeinen nicht verwerthen, weil die Sterbenswahrscheinlichkeiten der jüngeren Alter nahe an Null liegen, der Logarithmus für Null selbst (negativ) unendlich wird und die in den Sterbenswahrscheinlichkeiten dieser Alter vorhandenen Störungen daher sehr verstärkt in die Logarithmen übergehen. Aber wenn eine erste Ausgleichung schon vorliegt, die grössere Störungen beseitigt hat, kann eine zweite Ausgleichung recht gut an den Logarithmen vorgenommen werden und ist dann jeder anderen (mechanischen) vorzuziehen, weil ein neuer theoretischer Fehler so gut wie ganz vermieden wird.

Über die relative Höhe des theoretischen Fehlers verschiedener Ausgleichungsformeln—die äuf eine und dieselbe Grundlage angewandt werden—kommt man am besten ins Klare, wenn man die in die Formeln eingehenden unausgeglichenen Beobachtungswerthe als gesetzmässige ansieht und nach Derivirten des mittleren Gliedes oder entsprechenden centralen Differenzen entwickelt. Die unmittelbare Ausführung dieser Aufgabe ist indess recht mühsam, zumal es von Interesse ist, nicht bloss das erste, sondern auch das zweite Glied der hierbei entstehenden Korrektion zu kennen und ich habe deshalb einen anderen Weg eingeschlagen, der sich an frühere Higham'sche Untersuchungen anschliesst.

Es sei wieder S*p.q.r.* . . eine Summe, die aus successiven aufeinander folgenden Zusammenfassungen von je p, q, r Gliedern u. s. f. entstanden ist. Aldann hat man symbolisch

$$\mathrm{S}p.q.r.\,.=u_0\cdot\frac{1-(1+\delta)^p}{\delta}\cdot\frac{1-(1+\delta)^q}{\delta}\cdot\frac{1-(1+\delta)^r}{\delta}\cdot\,.$$

oder wenn man $(1+\delta)=e^{\frac{d}{dx}}$ setzt, um nach Derivirten entwickeln zu können,

$$\mathrm{S}p.q.r.\,.=u_0\cdot\frac{e^{\frac{p}{2}\cdot\frac{d}{dx}}-e^{-\frac{p}{2}\cdot\frac{d}{dx}}}{e^{\frac{1}{2}\cdot\frac{d}{dx}}-e^{-\frac{1}{2}\cdot\frac{d}{dx}}}\cdot\frac{e^{\frac{q}{2}\cdot\frac{d}{dx}}-e^{-\frac{q}{2}\cdot\frac{d}{dx}}}{e^{\frac{1}{2}\cdot\frac{d}{dx}}-e^{-\frac{1}{2}\cdot\frac{d}{dx}}}\cdot\,.$$

Entwickelt man nach Potenzen von $\frac{d}{dx}$, setzt

$$\begin{aligned}
p+q+r+\;.\;.\;.\;&=n\\
p^2+q^2+r^2+\;.\;.\;.\;&-n=\mathrm{B}_2\\
p^4+q^4+r^4+\;.\;.\;.\;&-n=\mathrm{B}_4\\
&\vdots
\end{aligned}$$

und

$$\begin{aligned}
\frac{5\mathrm{B}_2{}^2-2\mathrm{B}_4}{3\,.\,2^4}&=k_4\\
\frac{35\mathrm{B}_2{}^3-42\mathrm{B}_2\mathrm{B}_4+16\mathrm{B}_6}{9\,.\,2^6}&=k_6\\
&\vdots
\end{aligned}$$

so erhält man

$$\frac{\mathrm{S}p.q.r.\,.}{p.q.r.\,.}=u_0\left(1+\frac{\mathrm{B}_2}{24}\cdot\frac{d^2}{dx^2}+\frac{k_4}{2.3.4.5}\cdot\frac{d^4}{dx^4}+\frac{k_6}{2.3.4.5.6.7}\cdot\frac{d^6}{dx^6}+\,.\,.\right)\,(m)$$

womit eine Verallgemeinerung eines von Higham gefundenen Satzes erlangt ist. (*J.I.A.*, vol. xxv., pp. 245 u. ff.)

Berücksichtigt man, dass

$$\sigma^n = S_{5\,.\,5\,..}{}_{(n\ mal)}$$
$$\sigma_\xi^n = \sigma\,.\,(1+\delta)^\xi$$
$$= S_{5\,.\,5\,..}{}_{(n\ mal)}\,.\,e^{\xi\,.\,\frac{d}{dx}}$$

so ergiebt sich ferner für jedes ξ, Null eingeschlossen,

$$\frac{\sigma_{-\xi}^n + \sigma_\xi^n}{2} = u_0\,.\,\Big(1 + \frac{2n+\xi^2}{2}\,.\,\frac{d^2}{dx^2} + \frac{2\beta_4 + 60n\xi^2 + 5\xi^4}{120}\,.\,\frac{d^4}{dx^4} + \frac{2\beta_6 + 6\beta_4\,.\,\xi^2 + 30n\xi^4 + \xi^6}{720}\,.\,\frac{d^6}{dx^6} + \,..\Big)(n)$$

worin

$$\left.\begin{aligned}\beta_4 &= 30n^2 - 13n\\ \beta_6 &= 60n^3 - 78n^2 + 31n\\ &\vdots\end{aligned}\right| \quad (o)$$

Die bisher diskutirten Ausgleichungsformeln lassen sich sämmtlich auf die Form bringen

$$(u) = \frac{a_0\,.\,\sigma^n + a_1\,.\,\frac{\sigma_{-1}^n + \sigma_1^n}{2} + a_2\,.\,\frac{\sigma_{-2}^n + \sigma_2^n}{2} + \,..}{5^n} \qquad (p)$$

Wendet man nun (n) auf (p) an, und setzt zur Abkürzung

$$\left.\begin{aligned}a_0 + a_1 + a_2 + \,.. &= A_0\\ 1^2 a_1 + 2^2 a_2 + \,.. &= A_2\\ 1^4 a_1 + 2^4 a_2 + \,.. &= A_4\\ &\vdots\end{aligned}\right| \quad (q)$$

so erhält man

$$(u) = u_0\,.\,\Big(A_0 + \frac{2nA_0 + A_2}{2}\,.\,\frac{d^2}{dx^2} + \frac{2\beta_4\,.\,A_0 + 60nA_2 + 5A_4}{120}\,.\,\frac{d^4}{dx^4} + \frac{2\beta_6\,.\,A_0 + 6\beta_4 A_2 + 30nA_4 + A_6}{720}\,.\,\frac{d^6}{dx^6} + \,..\Big)$$

und diese Gleichung löst mit Leichtigkeit die hier gestellte Aufgabe.

In unseren Ausgleichungsformeln ist entweder $n=3$ order $n=5$, ausserdem sind sie so konstruirt, dass $A_0=1$, und der mit $\frac{d^2}{dx^2}$ verbundene Koëfficient verschwinden muss, also $A_2=-2n$ ist. Man hat daher entweder

$$(u) = u_0 + \frac{A_4 - 123{\cdot}6}{24}\,.\,u^{IV} + \frac{90\,A_4 + A_6 - 6294}{720}\,.\,u^{VI} + \,..$$

oder

$$(u) = u_0 + \frac{A_4 - 326}{24}\,.\,u^{IV} + \frac{150\,A_4 + A_6 - 29690}{720}\,.\,u^{VI} + \,..$$

je nachdem $n=3$ oder $n=5$ ist. In der Woolhouse'schen Ausgleichung ist zufolge (4) $n=3$, $a_0=7$, $a_1=-6$, $a_2=a_3=\,..\,=0$. In Formel (5) dagegen hat man $n=3$, $a_0=0{\cdot}6$, $a_1=1{\cdot}2$, $a_2=0$, $a_3=-0{\cdot}8$, während

für Formel (7) $n=3$, $a_0=1$, $a_1=2$, $a_2=-2$ und für Formel (6) $n=5$, $a_0=5$, $a_1=6$, $a_2=-12$, $a_3=0$, $a_4=2$. Man gewinnt also schliesslich folgende Relationen zwischen dem ausgeglichenen (u) und dem wahren u. Es ist in der Woolhouse'schen Ausgleichung

$$(u)=u-5.4\ u^{\text{IV.}}-9.5\ u^{\text{VI.}}+\ .\ .$$

für die Ausgleichung nach Formel (5)

$$(u)=u-7.8\ u^{\text{IV.}}-17.5\ u^{\text{VI.}}+\ .\ .$$

für die Higham'sche

$$(u)=u-6.4\ u^{\text{IV.}}-12.67\ u^{\text{VI}}+\ .\ .$$

und für die nach Formel (6)

$$(u)=u+37\ u^{\text{VI.}}+\ .\ .$$

Das Verhältniss von u^{IV} zu u^{VI} kann man schätzen, wenn man unter u die Sterbenswahrscheinlichkeit versteht und annimmt, dass diese der Form $a+b\ .\ c^x$ genügt, die annähernd der Gompertz-Makeham'schen Hypothese entspricht. Man hat alsdann, wenn der natürliche Logarithmus mit λ bezeichnet wird, $u_x=b\ .\ c^x\lambda c$, $u^{\text{IV}}=b\ .\ c^x\ .\ (\lambda c)^4$, $u^{\text{VI}}=b\ .\ c^x(\lambda c)^6$, $\frac{u^{\text{VI}}}{u^{\text{IV}}}=(\lambda c)^2$, und da der gewöhnliche Logarithmus von c nahe an 0·04, der natürliche nahe an 0·1 zu liegen pflegt, $\frac{u^{\text{VI}}}{u^{\text{IV}}}=0{\cdot}01$. In den Formeln, welche sowohl u^{IV} als u^{VI} enthalten, verschwindet also das 3te Glied praktisch vollkommen gegen das zweite und das Endergebniss ist, dass die Formel (6) die genauesten Resultate liefert und im Übrigen die Woolhouse'sche die Higham'sche und diese wieder die Formel (5) an Genauigkeit übertrifft. Der Fehler kann aber, nach der vorausgeschickten Untersuchung zu urtheilen, in allen Fällen nur klein sein, besonders wenn man die Ausgleichung an den Logarithmen der Sterbenswahrscheinlichkeiten vornimmt.

Die Formel (m) lässt sich ebenso wie (n) dazu verwerthen, mechanische Ausgleichungsformeln nach Higham'scher Methode versuchsweise abzuleiten und man kann diesen Versuchen noch eine verbesserte wissenschaftliche Grundlage geben, indem man von (p) ausgeht und die Koëfficienten a_0, a_1, . . so bestimmt, dass einerseits der Faktor von $\frac{d^2}{dx^2}$ und eventuell auch der von $\frac{d^4}{dx^4}$ verschwindet, und andererseits die Summe aus den quadrirten dritten oder höheren Differenzen der den Grössen u_0, u_1 . . selbst zukommenden Koëfficienten ein Minimum wird. Auf diesem Wege habe ich thatsächlich verschiedene Formeln gewonnen, die ganz praktische Rechnungsvorschriften gaben. Aber entweder waren diese doch komplicirter oder hatten geringere ausgleichende Kraft oder grössere theoretische Fehler als Formel (5) und ich bin daher zu der Überzeugung gelangt, dass es kaum möglich sein wird, eine zweckmässigere Formel als diese aufzustellen.

6. Die Verbesserung der ersten Ausgleichung mit Hülfe der rechnungsmässigen Sterbefälle.

Ist eine Ausgleichung durchgeführt, so pflegt man den Anschluss derselben an die Beobachtung dadurch zu prüfen, dass man rechnungsmässige und wirkliche Sterbefälle vergleicht. Gleichen sich die Abweichungen im Ganzen und für kürzere Altersstrecken nahezu aus, so wird der Anschluss als ein guter angesehen, ist das Gegentheil der Fall, so ist man berechtigt, die Ausgleichung zu verwerfen oder abzuändern. Unter diesen Umständen liegt es nahe, jene Abweichungen auch bei einer mechanischen Ausgleichung zum Ausgangspunkte von Verbesserungen zu wählen, wie dies schon längst bei der graphischen Methode, durch Sprague und Andere geschehen ist, und zwar wird man hier, um Willkürlichkeiten zu vermeiden und ein festes Verfahren zu erlangen, die Tafel in gleiche und sich aneinander schliessende, etwa fünfjährige, Intervalle zerlegen. Es seien $L_0, L_1 \ldots L_5$ die zu einem bestimmten Intervall gehörenden Lebenden unter Risiko, $T_0, T_1 \ldots T_5$ die wirklich beobachteten Sterbefälle, $q_0, q_1 \ldots q_5$ die aus der Ausgleichung hervorgegangenen Sterbenswahrscheinlichkeiten und $f_0, f_1 \ldots f_5$ die zu bestimmenden besseren Werthe der letzteren, so kann man einfach setzen.

$$\left.\begin{aligned} f_0 &= q_0 + \delta \\ f_1 &= q_1 + \delta \\ &\vdots \\ f_5 &= q_5 + \delta \end{aligned}\right| \quad (r)$$

worin

$$\delta = \frac{T_0 + T_1 + \ldots + T_5 - L_0 q_0 - L_1 q_1 - \ldots - L_5 q_5}{L_0 + L_1 + \ldots + L_5},$$

denn die Grösse δ ist eben diejenige, um welche die gewonnene Kurve im Durchschnitt verzeichnet ist und zu tief liegt. Von Wichtigkeit ist es, dass die Operation keineswegs einen neuen theoretischen Fehler erzeugt, sondern den in q vorhandenen sogar nahezu beseitigt. Um dies zu zeigen, wollen wir für einen Augenblick annehmen, dass das Beobachtungsmaterial unendlich gross ist und demzufolge keine Beobachtungsfehler entstanden sind, was freileich auch eine Ausgleichung überflüssig machen würde. Alsdann sind $\frac{T_0}{L_0}, \frac{T_1}{L_1}, \ldots \frac{T_5}{L_5}$ mit den wahren Sterbenswahrscheinlichkeiten $\phi_0, \phi_1 \ldots \phi_5$ identisch, während $q_0, q_1 \ldots q_5$ nur insoweit von denselben abweichen, als sie mit theoretischen Fehlern behaftet sind. Sind letztere resp. $c.q_0^{IV} + \ldots$, $c.q_1^{IV} + \ldots$, $\ldots c q_5^{IV} + \ldots$, worin q^{IV} die 4te Derivirte bedeutet, so hat man also $\phi_0 = q_0 + c q_0^{IV} + \ldots$, u. s. w. und

$$\delta = \frac{\begin{aligned} &L_0\phi_0 + L_1\phi_1 + \ldots + L_5\phi_5 - L_0(\phi_0 - c \,.\, q_0^{IV} - \ldots.) \\ &- L_1(\phi_1 - c \,.\, q_1^{IV} - \ldots) - \ldots - L_5(\phi_5 - c \,.\, q_5^{IV} - \ldots) \end{aligned}}{L_0 + L_1 + \ldots + L_5}$$

$$= c \,.\, \frac{L_0(q_0^{IV} + \ldots) + L_1(q_1^{IV} + \ldots) + \ldots + L_5(q_5^{IV} + \ldots)}{L_0 + L_1 + \ldots + L_5}$$

oder, wenn die Grössen q^{IV} nach $q^{IV}_{5/2}$ und den zugehörigen Derivirten entwickelt werden,

$$\delta = c \cdot q^{IV}_{5/2} + \ldots$$

Setzt man dies in (r) ein, und beachtet, dass $q^{IV}_{5/2}$ sich auch durch $q_0{}^{IV}$ und höhere Derivirte von q_0, ebenso durch $q_1{}^{IV}$ und höhere Derivirte dieser Grösse ausdrücken lässt u. s. f., so ergiebt sich

$$\begin{aligned} f_0 &= q_0 + c \cdot q_0{}^{IV} + \ldots \\ f_1 &= q_1 + c \cdot q_1{}^{IV} + \ldots \\ &\vdots \\ f_5 &= q_5 + c \cdot q_5{}^{IV} + \ldots \end{aligned}$$

und es stimmen somit unter den hier gemachten Voraussetzungen die verbesserten Werthe f und die wahren Sterbenswahrscheinlichkeiten bis auf Derivirte höherer Ordnung überein, als sie das erste Glied des theoretischen Fehlers in den ausgeglichenen Werthen q enthält. Ist aber das Beobachtungsmaterial nicht so umfangreich, dass Beobachtungsfehler ausgeschlossen sind, so können offenbar nur solche und nicht theoretische Fehler in f hinzutreten und es ist daher in f thatsächlich der ursprünglich begangene theoretische Fehler zum grössten Theil korrigirt.

Das erörterte Verbesserungsverfahren hat den Übelstand, dass es die Beobachtungen trotz der gleichen Intervalle nicht gleichmässig behandelt, weil sie innerhalb derselben verschiedene Stellen, von der ersten bis zur fünften, einnehmen können. Um auch diesen zu beseitigen, nehme ich die Zusammenfassung nicht nur für aneinandergrenzende fünfjährige Intervalle, sondern von Jahr zu Jahr für je fünfjährige Intervalle vor, so dass für jedes Alter eine Summe S entsteht, welche die zugehörige, sowie zwei vorausgegangene und zwei folgende Abweichungen umfasst, und eine besondere Korrektion bedingt. Das nunmehr zu befolgende Verfahren ergiebt sich aus dem Vorausgegangenen fast von selbst, denn wenn $\Sigma\Delta_{x-2}$, $\Sigma\Delta_{x-1}$, . . $\Sigma\Delta_{x+2}$ eine Reihe aufeinander folgender Abweichungssummen bedeuten, von denen die erste sich auf die Alter $x-4$, $x-3$, . . x, die zweite auf die Alter $x-3$ bis $x+1$ bezieht, u. s. f. und ΣL_{x-2}, ΣL_{x-1}, . . . ΣL_{x+2}, die zugehörigen Summen der Lebenden unter Risiko sind, so hat man aus $\Sigma\Delta_{x-2}$ und ΣL_{x-2} als gemeinschaftliche Korrektion von q_{x-2}, q_{x-1}, q_x, q_{x+1}, und q_{x+2}, $\delta_{x-2} = \frac{\Sigma\Delta_{x-2}}{\Sigma L_{x-2}}$ und ebenso folgt aus $\Sigma\Delta_{x-1}$ und ΣL_{x-1} als gemeinschaftliche Korrektion von q_{x-1}, . . q_{x+3}, $\delta_{x-1} = \frac{\Sigma\Delta_{x-1}}{\Sigma L_{x-1}}$, u. s. f., so dass man schliesslich an Stelle von q_x, fünf neue verbesserte Werthe, $q_x + \delta_{x-2}$, $q_x + \delta_{x-1}$, . . $q_x + \delta_{x+2}$ erhält, aus denen man zweckmässiger Weise das Mittel nimmt. Bezeichnet man den somit entstehenden verbesserten Werth von q_x mit $(f)_x$, so ist also

$$\begin{aligned} (f)_x &= \frac{(q_x + \delta_{x-2}) + (q_x + \delta_{x-1}) + \ldots + (q_x + \delta_{x+2})}{5} \\ &= q_x + \frac{\delta_{x-2} + \delta_{x-1} + \delta_x + \delta_{x+1} + \delta_{x+2}}{5} \end{aligned}$$

und die ganze Rechnung reducirt sich, insoweit die Verbesserungen in Betracht kommen, darauf, dass man die Abweichungen zwischen wirklichen und rechnungsmässigen Sterbefällen und ebenso die Lebenden unter Risiko successive für je 5 Jahre zusammenfasst, aus diesen zweierlei Summen die Quotienten bildet und letztere wieder in fnüfjährige Mittel zusammenzieht.

Eine besondere Behandlung bedingen die Anfangs– und Endalter der Tafel, für welche die zugehörigen $\Sigma\Delta$, ΣL und δ nach der allgemeinen Regel nicht erlangt werden können, die aber auch so schwach besetzt zu sein pflegen, dass hier eine genauere Korrektion unmöglich wird. Am richtigsten scheint es mir, für die ersten und letzten n Alter, wobei n je nach der Besetzung etwas grösser oder kleiner als 10 gewählt werden mag, je eine gemeinschaftliche Korrektion δ auf Grund des für die übrigen Korrektionen nicht benutzten Materials zu berechnen, so dass schliesslich jeder Theil des gesammten Materials mit seinem natürlichen Gewichte zu Verbesserungen herangezogen wird. In welcher Weise dies geschehen kann, ist aus dem nachstehenden Tableau zu ersehen.

(1) Index	(2)	(3)	(4)	(5)
(-2)	0	0	$L_0=\Sigma L_{-2}$	$\Delta_0=\Sigma\Delta_{-2}$
(-1)	0	0	$L_0+L_1=\Sigma L_{-1}$	$\Delta_0+\Delta_1=\Sigma\Delta_{-1}$
0	L_0	Δ_0	$L_0+L_1+L_2=\Sigma L_0$	$\Delta_0+\Delta_1+\Delta_2=\Sigma\Delta_0$
1	L_1	Δ_1	$L_0+L_1+L_2+L_3=\Sigma L_1$	$\Delta_0+\Delta_1+\ldots+\Delta_3=\Sigma\Delta_1$
2	L_2	Δ_2	$L_0+L_1+L_2+L_3+L_4=\Sigma L_2$	$\Delta_0+\ldots+\Delta_4=\Sigma\Delta_2$
3	L_3	Δ_3	$L_1+L_2+L_3+L_4+L_5=\Sigma L_3$	$\Delta_1+\ldots+\Delta_5=\Sigma\Delta_3$
⋮	⋮	⋮	⋮	⋮
$n-1$	L_{n-1}	Δ_{n-1}	$L_{n-3}+\ldots+L_{n+1}=\Sigma L_{n-1}$	$\Delta_{n-3}+\ldots+\Delta_{n+1}=\Sigma\Delta_{n-1}$
n	L_n	Δ_n	$L_{n-2}+\ldots+L_{n+2}=\Sigma L$	$\Delta_{n-2}+\ldots+\Delta_{n+2}=\Sigma\Delta_n$
⋮	⋮	⋮	⋮	⋮

Die erste Kol. giebt den Index, der das Alter vertritt und zwar so, dass das Anfangsalter der Tafel durch Null dargestellt ist, die zweite enthält die Lebenden unter Risiko, die dritte die Abweichungen Δ, während die vierte und fünfte die zusammen gefassten L und Δ oder ΣL und $\Sigma\Delta$ geben. Dabei ist das Schema über das Anfangsalter hinaus soweit fortgesetzt, als in (4) und (5) nach der allgemeinen Regel noch Werthe entstehen, wenn für den Index -1 und -2 die 2te und 3te Kol. mit Nullen ausgefüllt werden, und eine ähnliche Erweiterung hat man sich für das Ende hinzuzudenken. Nun sieht man ohne Weiteres ein, dass die Summen der 4ten und 5ten Spalte die 5fache Summe aller Lebenden unter Risiko bez. den 5fachen Betrag der Gesammtabweichung zwischen wirklichen und rechnungsmässigen Sterbefällen ergeben müssen und dass man also, wenn die regelmässige Korrektionsrechnung erst mit dem Alter n einsetzt, den unbenutzten (oberen) Rest des Materials oder genauer ausgedrückt, den fünffachen Betrag dieses Restes erhält, wenn man die Zahlen der Kol. 4 und 5 von -2 bis $n-1$ zusammenfasst. Seien $\Sigma\Sigma L$ und $\Sigma\Sigma\Delta$ die hierbei entstehenden neuen Summen, so hat

man demnach für die gemeinschaftliche Korrektion δ der Indices 0 bis $n-1$,

$$\delta = \frac{\Sigma\Sigma\Delta}{\Sigma\Sigma L} = \frac{5\Delta_0 + 5\Delta_1 + \ldots + 5\Delta_{n-3} + 4\Delta_{n-2} + 3\Delta_{n-1} + 2\Delta_n + \Delta_{n+1}}{5L_0 + 5L_1 + \ldots + 5L_{n-3} + 4L_{n-2} + 3L_{n-1} + 2L_n + L_{n+1}}$$

und ein ähnlicher Ausdruck gilt für die Korrektion der letzten Alter. Die Behandlung des δ ist aber ganz dieselbe, wie die der regelmässig berechneten δ_n, δ_{n+1} . . und man hat nur zu beachten, dass bei der Bildung des Mittels so zu verfahren ist, als ob die dem wirklichen Tafelanfang und Tafelende vorausgehenden bez. folgenden zwei Indices ebenfalls mit δ besetzt wären, wie es in dem nachfolgenden Schema angedeutet ist.

Index		
(-2)	δ	
(-1)	δ	
0	δ	$c = \delta$
1	δ	$c_1 = \delta$
2	δ	$c_2 = \delta$
:		:
$n-3$	δ	$c_{n-3} = \delta$
$n-2$	δ	$c_{n-2} = \frac{4\delta + \delta_n}{5}$
$n-1$	δ	$c_{n-1} = \frac{3\delta + \delta_n + \delta_{n+1}}{5}$
n	δ_n	$c_n = \frac{2\delta + \delta_n + \delta_{n+1} + \delta_{n+2}}{5}$
$n+1$	δ_{n+1}	$c_{n+1} = \frac{\delta + \delta_n + \delta_{n+1} + \delta_{n+2} + \delta_{n+3}}{5}$
$n+2$	δ_{n+2}	$c_{n+2} = \frac{\delta_n + \delta_{n+1} + \ldots + \delta_{n+4}}{5}$
$n+3$	δ_{n+3}	$c_{n+3} = \frac{\delta_{n+1} + \delta_{n+2} + \ldots + \delta_{n+5}}{5}$

u. s. f.

7. Anwendungen.

Durch die Verbesserung der ersten Ausgleichung, wie sie im vorigen Abschnitt erörtert ist, entstehen neue kleine Unregelmässigkeiten in den Sterbenswahrscheinlichkeiten und es bedarf daher einer zweiten Ausgleichung, um zu einem befriedigenden Endresultat zu gelangen. Mit Rücksicht hierauf scheint es mir aber zweckmässig, in der ersten Ausgleichung eine möglichst einfache, rationell konstruirte Formel, wie etwa die Higham'sche und erst in der definitiven die neue und stärker ebnende Formel (5) anzuwenden. Wenn man hierbei dann nicht die Sterbenswahrscheinlichkeiten, sondern deren Logarithmen zu Grunde legt, so sind im Ganzen nur minimale theoretische Fehler zu befürchten, da der in der ersten Ausgleichung begangene durch die Verbesserung beseitigt enscheint und die Logarithmen nur solche verursachen, welche einen geringen Bruchtheil der Woolhouse'schen ausmachen.

Die Formeln (5) und (7) sind, wie jede symmetrische Ausgleichungsformel, zunächst nicht für den Anfang und das Ende der Tafel anwendbar, weil sie Glieder enthalten, die über die zu bestimmenden hinausgreifen. Sind die höchsten Alter gut besetzt und laufen die beobachteten Sterbenswahrscheinlichkeiten ganz oder nahezu in 1 aus, so kann man die am ende fehlenden Glieder in der 1st2n Ausgleichung einfach dadurch gewinnen, dass man die Sterbenswahrscheinlichkeit nach dem letzten wirklich besetzten Alter konsequent=1 setzt. Der Erfolg wird sein, dass auch die ausgeglichenen Werthe sich rasch 1 nähern und vorübergehend in einer Kurvatur die Einheit überschreiten, um schliesslich dauernd in diese überzugehen. Die über die Einheit hinausgehenden Werthe hat man alsdann, bevor zur Verbesserung geschritten wird, durch 1 zu ersetzen und ein gleiches Verfahren ist einzuschlagen, wenn die Verbesserung selbst solche ergiebt, was sich indessen vermeiden lässt, da man das letzte δ immer auf Alter stützen kann, für die es negativ wird. Gehen aber die Sterbenswahrscheinlichkeiten auch in der zweiten Ausgleichung über 1 oder die zugehörigen Logarithmen über Null hinaus, so werden sie nunmehr definitiv=1 bez. Null gesetzt.

Sind die letzten Alter dagegen ungenügend besetzt oder hört die Tafel gar mit einem Alter auf, für das ein natürlicher Abschluss nicht angenommen werden kann, so empfiehlt es sich, die ursprüngliche Tafel zunächst künstlich unter Anwendung der Formel $q_x = b \,.\, c^x$ zu ergänzen, die annähernd der Gompertz'schen Hypothese entspricht und grade in den höheren Altern recht brauchbare Werthe liefert. Die Rechnung gestaltet sich dabei, wie folgt. Es seien die Alter x bis $x+n-1$ und $x+n$ bis $x+2n-1$ noch einigermaassen mit Beobachtungen besetzt und n eine Zahl, die je nach dem Umfang des Materials=10 oder 15 gesetzt werden mag. Man hat alsdann nach jener Hypothese

$$q_x + q_{x+1} + \ \ldots\ + q_{x+n-1} = \sum_{x}^{x+n} q_x = b \,.\, c^x \,.\, \frac{c^n - 1}{c - 1}$$

und

$$q_{x+n} + q_{x+n+1} + \ \ldots\ + q_{x+2n+1} = \sum_{x+n}^{x+2n} q_x = b \,.\, c_{x+n} \,.\, \frac{c^n - 1}{c - 1}$$

woraus sich ergiebt

$$\log c = \frac{1}{n} \,.\, \left(\log \sum_{x+n}^{x+2n} q_x - \log \sum_{x}^{x+n} q_x \right)$$

$$q_{x+2n} = \frac{c-1}{1 - \frac{1}{c^n}} \cdot \sum_{x+n}^{x+2n} q$$

und

$$\begin{aligned} \log q_{x+2n+1} &= \log q_{x+2n} \ \ + \log c \\ \log q_{x+2n+2} &= \log q_{x+2n+1} + \log c \\ &\vdots \end{aligned}$$

so dass man nach der Bestimmung von $\log q_{x+2n}$ die Logarithmen der folgenden Sterbenswahrscheinlichkeiten durch fortgesetzte Addition von $\log c$ erhält. Die für q_{x+2n}, q_{x+2n+1} . . . erlangten Werthe, die beliebig, fortgesetzt werden können, treten nunmehr an Stelle der wirklich für

$x+2n$, $x+2n+1$ . . . beobachteten Werthe und die weiteren Operationen vollziehen sich einschliesslich der Verbesserungen genau so wie im vorigen Fall.

Für den Anfang der Tafel empfiehlt es sich, bei guter Besetzung einen Durchschnitt aus den ersten fünf oder zehn Sterbenswahrscheinlichkeiten zu nehmen und diesen als Näherungswerth für die vorausgehenden Alter anzusehen, wodurch zunächst die erste Ausgleichung ermöglicht und zugleich eine Grundlage für die zweite geschaffen wird. Liegen aber nur schwache Beobachtungen vor, so wird man aus den Lebenden unter Risiko und den Sterbefällen der ersten 5 bis 10 Jahre einen Durchschnittssatz berechnen, der dann in der 1sten Ausgleichung sowohl für diese als die vorausgehenden Jahre gilt. Eventuell kann man auch fremde Beobachtungen heranziehen und überhaupt ist hier dem persönlichen Urtheil und Geschick ein gewisser Spielraum gelassen. Ein im Laufe der Rechnung in dem ergänzten Stück etwa eintretendes Minimum oder Maximum beseitigt man konsequent sowohl nach der 1stzn als der 2ten Ausgleichung, indem man den betreffenden Werth für die ganze vorausgehende Strecke mit gelten lässt, es sei denn, dass die Kurvatur als eine natürliche erscheint oder anderen Beobachtungen entspricht.

Ich habe das neue Verfahren zunächst an der $H^{M(5)}$ Tafel versucht, welche auf einem umfassenden Beobachtungsmaterial beruht und insofern von besonderem Interesse ist, als für sie neben der Woolhouse'schen schon eine zweite von Sprague herrührende graphische Ausgleichung vorliegt, die in geradezu mustergültiger Weise durchgeführt ist (*J.I.A.*, vol. xxix., p. 65). Die Beobachtungen sind auch hier, wenn man die Tafel, wie Woolhouse mit dem Alter 10 beginnen lassen will—Sprague wählt sogar ein jüngeres Anfangsalter—für eine Reihe von Jahren nur dürftig und ich habe deshalb in der ersten Ausgleichung die für die Alter 10–19 gültige Sterbenswahrscheinlichkeit von 0·0052, die sowohl mit den Sterblichkeitssätzen der folgenden Altersklassen als dem in derselben Altersklasse, aber für die Versicherungsjahre 0–4 beobachteten im Einklang steht, als gemeinschaftlichen Durchschnittswerth für das Alter 19 und die vorhergehenden Alter benutzt.

Anfangs-Sterblichkeit der 20 engl. Gesellschaften.

Altersklasse	Sämmtliche Versicherungsjahre		Versicherungsjahre 0–4		Vers. Jahr 5 und aufwärts		
	Sterbefälle	Sterbenswahrscheinlichkeit	Sterbefälle	Sterbenswahrscheinlichkeit	Sterbefälle	Sterbenswahrscheinlichkeit	
10–14	10	0·0038	6	0·0032	4	0·0055	0·0052
15–19	36	47	27	46	9	50	
20–24	232	69	191	65	41	94	
25–29	659	69	464	62	195	97	

Vom Alter 97 ab fehlen die Beobachtungen, nachdem das Alter 96 die Sterbenswahrscheinlichkeit 1 ergeben hat, es wurde daher für 97 und aufwärts durchgängig der Werth 1 angesetzt und im Übrigen so verfahren, wie es für einen derartigen Fall oben vorgesehen ist.

Die Ergebnisse sind in Tab. 6 niedergelegt. Zur Erläuterung der

zwischen der 1sten und 2ten Ausgleichung liegenden Korrektionsrechnung füge ich von dieser ein Bruchstück als Tab. 5 bei. Wie man sieht, sind hier nur 3stellige Logarithmen in Anwendung gebracht, die für den Zweck vollkommen ausreichen.

TAB. 5.—BRUCHSTÜCK AUS DER KORREKTION ZWISCHEN 1STER UND 2TER AUSGLEICHUNG.

x	Ausgeglichene Sterblichkeitsprocentsätze nach Higham $100\,q_x^{(1)}$	Lebende unter Risiko dividirt durch 100 $\frac{L_x}{100}$	Überschuss der wirklichen Sterbefälle über die rechnungsmässigen nach $q_x^{(1)}$	Summen zu je 5 Werthen $\frac{\Sigma L_x}{100}$	Summen zu je 5 Werthen ΣZ_x	$100\,k_x = 100 . \frac{\Sigma Z_x}{\Sigma L_x}$	Mittel aus je 5 Werthen oder Korrektion $100\,k_x^{(1)}$	Korrigirte Sterblichkeitsprocentsätze $100\,q_x^{(2)} = 100\,q_x^{(1)} + 100\,k_x^{(1)}$
:								:
(8)				0·8	−0·4	−0·067		0·425
(9)				1·8	−0·9	−0·067		0·425
10	0·520	0·81	−0·4	3·2	−0·6	−0·067	−0·067	0·425
11	520	1·02	−0·5	5·0	−0·5			
12	520	1·39	0·3	7·3	0·4	:	:	:
13	517	1·79	0·1	9·1	−0·5			
14	509	2·30	0·9	11·0	−1·4	−0·067	−0·067	0·425
15	495	2·60	−1·3	12·9	−2·4	−0·067	−0·067	0·425
16	492	2·92	−1·4	15·2	−1·7	−0·067	−0·067	0·425
17	506	3·31	−0·7	17·9	−0·7	−0·067	−0·067	0·439
18	551	4·05	0·8	21·1	−0·8	−0·067	−0·036	0·515
19	626	4·98	1·9	24·9	0·8	−0·067	0·025	0·651
20	749	5·86	−1·4	29·7	2·6	0·087	0·032	0·781
21	870	6·70	0·2	35·6	8·5	0·239	0·046	0·916
22		8·13	1·1	43·7	−1·4	−0·032		
23		9·97	6·7	55·7	−0·1	0·002		
24		13·0	−8·0	75·9				
25		17·9	0·1	106				
:		:	:	:	:	:	:	:
83	18·655	4·57	9·7					
84	19·698	3·35	−7·0					
85	20·362	2·53	3·6	13·5	6·7	0·495	0·317	20·679
86	21·317	1·82	1·2	9·87	1·3	0·132	0·371	21·688
87	22·674	1·27	−0·8	7·08	5·0	0·490	0·419	23·093
88	24·063	0·90	4·3	4·98	−0·7	0·490	0·418	24·481
89	25·511	0·56	−3·3	3·48	−1·9	0·490	0·490	26·001
90	28·205	0·43	−2·1	2·41	1·0	0·490	0·490	28·695
91	31·108	0·32	0·0	1·61	−0·3	0·490	0·490	31·598
92	34·279	0·20	2·1	1·08	1·5	0·490	0·490	34·769
93	39·793	0·10	3·0	0·68	2·8			40·283
94	49·187	0·03	−1·5	0·38	3·4	:	:	49·677
95	60·143	0·03	−0·8	0·18	1·3			60·633
96	72·162	0·02	0·6	0·08	−1·7	0·490	0·490	72·652
97	84·650			0·05	−0·2	0·490	0·490	85·150
98	94·860			0·02	0·6	0·490	0·490	95·350
99	100·000 (100·310)					0·490	0·490	100,000 (100,800)
100								100,000
:								:

Summen zu je 5 Werthen: 130 (Sterbefälle 10–19); −8·7 (Sterbefälle 10–19); 22·0 (Sterbefälle 83–98); 10·8 (Sterbefälle 83–98)

Tab. 6.—Ausgleichung nach der neuen Methode und nach Sprague ($H^{M(5)}$ Tafel.)

Alter	Neue Methode							Sprague's graphische Ausgleichung	
	1ste Ausgleichung	Korrigirte 1ste Ausgleichung	Log. 1000 $q_x^{(2)}$ der 2ten Ausgleichung zu Grunde gelegt	2te Ausgleichung					
	$100\ q_x^{(1)}$	$100\ q_x^{(2)}$		Log. 1000 $(q)_x$	$100\ (q)_x$	δ	δ^2	$100\ (q)_x$	δ
10	0·520	0·425	0·6284	0·6268	0·415	0		0·32	3
11	0·520	0·425	6284	6244	0·415	0	0	0·35	3 0
12	0·520	0·425	6284	6211	0·415	0	0	0·38	3 1
13	0·517	0·425	6284	6183	0·415	1	1	0·42	4 0
14	0·509	0·425	6284	6192	0·416	9	8	0·46	4 0
15	0·495	0·425	6284	6286	0·425	23	14	0·50	4 0
16	0·492	0·425	6284	6512	0·448	42	19	0·54	5 1
17	0·506	0·439	6425	6898	0·490	64	22	0·59	6 1
18	0·551	0·515	7118	7438	0·554	90	26	0·65	7 1
19	0·626	0·651	8136	8086	0·644	108	18	0·72	8 2
20	0·749	0·781	8927	8760	0·752	114	6	0·80	10 −2
21	0·870	0·916	9619	9373	0·866	100	−14	0·90	8 −2
22	0·971	1·037	1·0158	9850	0·966	70	−30	0·98	6 −3
23	1·034	1·090	0374	1·0153	1·036	32	−38	1·04	3 −2
24	1·076	1·070	0294	0284	1·068	−2	−34	1·07	1 −1
25	1·058	1·056	0237	0276	1·066	−24	−22	1·08	0 −1
26	1·025	1·028	0120	0177	1·042	−34	−10	1·08	−1 −5
27	0·994	0·993	0·9970	0035	1·008	−34	0	1·07	−6 0
28	0·976	0·963	9836	0·9887	0·974	−28	6	1·01	−6 2
29	0·943	0·942	9741	9760	0·946	−20	8	0·95	−4 1
30	0·923	0·928	9676	9668	0·926	−9	11	0·91	−3 2
31	0·919	0·911	9595	9625	0·917	3	12	0·88	−1 3
32	0·919	0·904	9562	9637	0·920	14	11	0·87	2 2
33	0·925	0·915	9614	9704	0·934	25	11	0·89	4 2
34	0·952	0·948	9768	9819	0·959	33	8	0·93	6 0
35	0·996	0·990	9956	9966	0·992	36	3	0·99	6 −1
36	1·037	1·044	1·0187	1·0122	1·028	35	−1	1·05	5 −2
37	1·073	1·086	0358	0265	1·063	28	−7	1·10	3 −2
38	1·102	1·114	0469	0380	1·091	22	−6	1·13	1 −0·5
39	1·121	1·126	0515	0464	1·113	16	−6	1·14	0·5 0·5
40	1·128	1·131	0535	0527	1·129	15	−1	1·145	0·5 0·5
41	1·139	1·136	0554	0585	1·144	20	5	1·15	1 0·5
42	1·157	1·149	0603	0661	1·164	30	10	1·16	1·5 1
43	1·185	1·178	0712	0770	1·194	43	13	1·175	2·5 2·5
44	1·228	1·224	0878	0922	1·237	56	13	1·20	5 2
45	1·290	1·284	1086	1116	1·293	69	13	1·25	7 2
46	1·364	1·359	1332	1342	1·362	79	10	1·32	9 1
47	1·443	1·449	1611	1587	1·441	86	7	1·41	10

TAB. 6—*Fortsetzung.*

Alter	Neue Methode							Sprague's graphische Ausgleichung		
	1STE AUSGLEICHUNG	Korrigirte 1ste Ausgleichung	Log. 1000 $q_x^{(2)}$ der 2ten Ausgleichung zu Grunde gelegt	2TE AUSGLEICHUNG						
	$100\ q_x^{(1)}$	$100\ q_x^{(2)}$		Log. $1000(q)_x$	$100\ (q)_x$	δ	δ^2	$100\ (q)_x$	δ	δ^2
48	1·533	1·541	1878	1·1838	1·527	8	2	1·51	10	0
49	1·623	1·631	2125	2083	1·615	9	2	1·61	10	0
50	1·707	1·717	2348	2318	1·705	9	2	1·71	10	0
51	1·790	1·800	2553	2544	1·797	9	2	1·81	10	0
52	1·884	1·881	2744	2767	1·891	10	6	1·81	10	0
53	1·983	1·979	2965	2990	1·991	10	8	2·01	11	1
54	2·093	2·097	3216	3221	2·099	11	11	2·12	13	2
55	2·217	2·223	3469	3460	2·218	13	13	2·25	14	1
56	2·352	2·356	3722	3711	2·350	14	15	2·39	15	1
57	2·495	2·500	3979	3974	2·497	16	18	2·54	16	1
58	2·656	2·654	4239	4253	2·662	18	22	2·70	18	2
59	2·844	2·831	1·4519	1·4548	2·849	21	25	2·88	20	2
60	3·055	3·047	4839	4859	3·061	23	27	3·08	22	2
61	3·293	3·288	5169	5185	3·300	26	23	3·30	24	2
62	3·562	3·560	5515	5518	3·562	28	21	3·54	26	2
63	3·857	3·862	5868	5849	3·845	29	12	3·80	28	2
64	4·157	4·173	6205	6170	4·140	30	6	4·08	30	2
65	4·461	4·495	6527	6475	4·441	31	9	4·38	33	3
66	4·765	4·800	6812	6768	4·751	32	15	4·71	36	3
67	5·073	5·089	7066	7055	5·076	35	34	5·07	39	3
68	5·391	5·398	7322	7352	5·435	41	55	5·46	43	4
69	5·792	5·757	7602	7671	5·849	49	77	5·89	47	4
70	6·288	6·214	7934	8021	6·340	57	87	6·36	53	6
71	6·911	6·838	8349	8400	6·918	66	86	6·89	59	6
72	7·614	7·610	8814	8798	7·582	73	70	7·48	66	7
73	8·402	8·423	9255	9199	8·316	78	48	8·14	73	7
74	9·178	9·272	9672	9590	9·098	81	30	8·87	79	6
75	9·950	10·018	2·0008	9961	9·910	84	28	9·66	86	7
76	10·724	10·768	0321	2·0314	10·75	88	4	10·52	95	9
77	11·569	11·529	0618	0657	11·63	96	8	11·47	103	8
78	12·507	12·430	0945	1000	12·59	104	8	12·50	113	10
79	13·577	13·479	1297	1346	13·63	115	11	13·63	122	9
80	14·772	14·701	1674	1696	14·78	121	6	14·85	132	10
81	16·040	16·034	2050	2039	15·99	124	3	16·17	141	9
82	17·377	17·454	2419	2363	17·23	122	−2	17·58	151	10
83	18·655	18·852	2754	2659	18·45	115	−7	19·09	161	10
84	19·698	19·902	2989	2923	19·60	112	−3	20·70	171	10
85	20·362	20·679	3155	3163	20·72	110	−2	22·41	182	11
86	21·317	21·688	3362	3389	21·82	121	11	24·23	193	11
87	22·674	23·093	3635	3622	23·03	141	20	26·16	205	12
88	24·063	24·481	3888	3881	24·44	180	39	28·21	218	13
89	25·511	26·001	4150	4189	26·24	240	60	30·39	237	19

Tab. 6—*Fortsetzung.*

Alter	Neue Methode							Sprague's graphische Ausgleichung		
	1ste Ausgleichung	Korrigirte 1ste Ausgleichung	Log. 1000 $q_x^{(2)}$ der 2ten Ausgleichung zu Grunde gelegt	2te Ausgleichung						
	100 $q_x^{(1)}$	100 $q_x^{(2)}$		Log. 1000 $(q)_x$	100 $(q)_x$	δ	δ^2	100 $(q)_x$	δ	δ^2
90	28·205	28·695	4578	4569	28·64	328	88	32·76	263	26
91	31·108	31·598	4997	5041	31·92	452	124	35·39	301	38
92	34·279	34·769	5412	5616	36·44	610	158	38·40	560	259
93	39·793	40·283	6051	6288	42·54	789	179	44·00	1200	640
94	49·187	49·677	6962	7027	50·43	958	169	56·00	1800	600
95	60·143	60·633	7827	7782	60·01	1064	106	74·00	2600	800
96	72·162	72·652	8613	8491	70·65	1052	−12	100·00		
97	84·650	85·140	9301	9094	81·17	905	−147			
98	94·860	95·350	9793	9553	90·22	652	−253			
99	100·000 (100·310)	100·000 (100·490)	3·0000	9856	96·74					

Die Sprague'sche Ausgleichung kann als sehr regelmässig gelten, gleichwohl stufen sich die 2ten Differenzen der neuen Ausgleichung noch etwas gesetzmässiger ab als in jener. Bemerkenswerth ist es, dass die beiden Ausgleichungen mit einer Ausnahme eine nahezu parallel laufende Wellenbewegung der Sterblichkeitskurve zeigen, was sowohl für die Zuverlässigkeit des Beobachtungsmaterials als der Bearbeitungsmethoden selbst spricht. Jene Ausnahme aber, welche sich, wenn man die 2ten Differenzen als maassgebend ansieht, in den Altern 73 bis 86 bemerkbar macht, rührt davon her, dass Sprague eine eingreifende Korrektur der Kurve vorgenommen hat, um eine beim Alter 73 beobachtete besonders starke Sterblichkeit theilweise auf spätere Alter mit zu verlegen. Ob dies Verfahren gerechtfertigt ist, mag dahingestellt bleiben, auf jeden Fall schliesst sich die neue Ausgleichung an dieser Stelle, ohne irgend welchen Bruch zu zeigen, genauer an die Beobachtung, als die Sprague'sche, was nicht gerade als ein Übelstand angesehen werden kann.

Inwieweit die beiden Ausgleichungen die ursprünglichen Beobachtungen wiedergeben, ist aus der folgenden Tabelle zu ersehen, die auch die Woolhouse'sche und die von mir in der 1sten Ausgleichung benutzte Higham'sche Methode berücksichtigt. Die Resultate für Woolhouse und Sprague habe ich der oben citirten Sprague'schen Abhandlung entnommen, die übrigens einige Rechenfehler enthält, die hier beseitigt sind.[1]

[1] Tab. B auf S. 97 der Abhandlung giebt die "Expected Deaths" für Sprague und die Altersklassen 54–58 und 59–65 um resp. 10 zu hoch und 10 zu niedrig, wodurch sich die Abweichungen irrthümlich auf 6·8 und −9.8 gegen −3·2 und −0·2 stellen.

TAB. 7.—ABWEICHUNGEN ZWISCHEN WIRKLICHER UND RECHNUNGSMÄSSIGER STERBLICHKEIT. ($H^{M(5)}$)

Altersklasse.	Wirkliche Sterbefälle.	Überschuss der rechnungsmässigen Sterbefälle über die wirklichen.	Akkumulirte Abweichungen.	Altersklasse.	Wirkliche Sterbefälle.	Überschuss der rechnungsmässigen Sterbefälle über die wirklichen.	Akkumulirte Abweichungen.
		Woolhouse.				Sprague.	
10–16	4	0·1	0·1				
17–20	12	− 0·1	0·0	10–19	13	1·2	1·2
21–22	15	− 0·1	− 0·1	20–22	18	0·7	1·9
23–26	72	− 1·4	− 1·5	23–30	306	− 0·3	1·6
27–32	428	6·2	4·7	31–36	840	− 0·1	1·5
33–37	873	− 5·2	− 0·5	37–44	2131	− 0·8	0·7
38–42	1306	1·3	0·8	45, 46	622	0·9	1·6
43–47	1583	− 7·8	− 7·0	47–53	2577	− 0·6	1·0
48–55	3024	4·0	− 3·0	54–58	2021	− 3·2	− 2·2
56–62	2814	3·2	0·2	59–65	2808	0·2	− 2·0
63–67	1960	1·7	1·9	66–70	1779	5·4	3·4
68–72	1650	10·0	11·9	71–73	917	6·4	9·8
73–79	1649	−11·4	0·5	74–80	1498	−39·2	−29·4
80–84	520	− 1·4	− 0·9	81–86	475	11·6	−17·8
85–90	170	1·3	0·4	87–96	104	15·0	− 2·8
91–96	29	− 1·7	− 1·3				
Summe	16109	− 1·3		Summe	16109	− 2·8	
		Higham. (Vorbereitende Ausgleichung.)				Neues Verfahren.	
10–18	8	0·6	0·6	10–19	13	− 0·6	− 0·6
19–22	23	0·1	0·7	20–22	18	0·0	− 0·6
23–26	72	− 1·3	− 0.6	23–26	72	− 0·8	− 1·4
27–34	717	− 2·8	− 3·4	27–34	717	0·7	− 0·7
35–41	1612	4·3	0·9	35–37	584	1·0	0·3
42–44	876	− 4·4	− 3·5	38–42	1306	0·6	0·9
45–47	985	− 0·6	− 4·1	43, 44	598	− 2·8	− 1·9
48–55	3024	− 0·7	− 4·8	45–47	985	− 0·8	− 2·7
56–61	2410	0·4	− 4·4	48–55	3024	1·5	− 1·2
62–67	2364	− 0·7	− 5·1	56–63	3225	0·2	− 1·0
68–70	1024	− 1·2	− 6·3	64, 65	794	0·9	− 0·1
71–78	2109	− 0·1	− 6·4	66–70	1779	4·1	4·0
79–83	627	− 3·8	−10·2	71–78	2109	− 4·6	− 0·6
84–86	154	2·2	− 8·0	79–85	741	− 1·2	− 1·8
87–89	65	− 0·2	− 8·2	86–89	105	0·6	− 1·2
90–96	39	− 2·3	− 9·5	90–96	39	− 0·2	− 1·4
Summe	16109	− 9·5		Summe	16109	− 1·4	

Der Anschluss ist bei allen Methoden recht gut, am besten aber doch nach der neuen. Dass das Gesammtresultat von Woolhouse ein so günstiges ist, dürfte übrigens bis zu einem gewissen Grade auf Zufall beruhen und sich nicht bei jeder Tafel wiederholen.

Um ein Beispiel zu geben, bei dem geringeres Beobachtungsmaterial in Frage kommt, habe ich noch die Erfahrungen ausgeglichen, die von der Gothaer Bank in Betreff evangelischer Geistlicher von 1829–1886 und für die Versicherungsjahre 6 und aufwärts gemacht sind. Die Daten sind, wie man aus der nachstehenden Tabelle erkennt, bis über das 30. Lebensjahr hinaus überaus dürftig und die Lebenden unter Risiko hören schon mit dem 90. Lebensjahre auf, bei dem die Gothaer Bank das versicherte Kapital auch für lebenslängliche Versicherungen

spätestens auszahlt. Demzufolge wurde in der 1sten Ausgleichung für das Alter 34 und die weiter zurückliegenden Alter ein Durchschnittswerth, und zwar die Sterbenswahrscheinlichkeit der Altersklasse 26–34 mit 0·0052 zu Grunde gelegt, während für die Alter von 86 an und aufwärts eine künstliche Ergänzung auf Grund der Sterbenswahrscheinlichkeiten von 66–75 und 76–85 nach den oben gegebenen Vorschriften eintrat. Bei der Korrektionsrechnung aber wurde für die Alter bis 34 und die Alter von 83 ab je ein gemeinschaftliches δ bestimmt. Das Material ist schon einmal und zwar von mir selbst auf graphischem Wege ausgeglichen worden (Vergl. die Abhandlung von Karup und Gollmer: Die Mortalitätsverhältnisse des geistlichen Standes, etc., Jahrbücher für Nationalökonomie und Statistik, Jena, Sechzehnter Band) und ich konnte daher auch diesmal der neu gewonnenen Zahlenreihe eine zweite als Kriterium gegenüberstellen.

Tab. 8.—Das neue Ausgleichungsverfahren, angewandt auf die aus den Erfahrungen der Gothaer Bank abgeleitete Sterblichkeitstafel für Geistliche (6. Versich.-Jahr und aufwärts).

Alter	Personen unter Risiko	Sterbefälle	Sterblichkeitsprocentsätze					Sterblichkeitsprocentsätze nach der graphischen Ausgleichung
			Beobachtet	Der Ausgleichung zu Grunde gelegt	Ausgeglichen	δ	δ^2	
20	1			0·52	0·470			
21	3			0·52	0·470			
22	3			0·52	0·470			
23	7			0·52	0·470			
24	14			0·52	0·470			
25	29	1	3·45	0·52	0·470			
26	41			0·52	0·470			0·49
27	59			0·52	0·470	0	2	0·49
28	74·5			0·52	0·472	2	4	0·50
29	103·5			0·52	0·478	6	7	0·50
30	138·5	1	0·72	0·52	0·491	13	10	0·51
31	192·5	3	1·56	0·52	0·514	23	9	0·51
32	260	1	0·38	0·52	0·546	32	6	0·52
33	368·5	1	0·27	0·52	0·584	38	1	0·53
34	498·5	3	0·60	0.52	0·621	37	9	0·54
35	634·5	6	0·95		0·649	28	14	0·55
36	767	5	0·65	wie in der vor Kol.	0·663	14	15	0·56
37	906	7	0·77		0·662	1	11	0·58
38	1057	8	76		0·650	12	3	0·59
39	1212	5	41		0·635	15	6	0·61
40	1352	6	44		0·626	9	8	0·63
41	1472	11	75		0·625	1	12	0·65
42	1605	10	62		0·636	11	11	0·68
43	1709	15	88		0·658	22	9	0·70
44	1801	8	44		0·689	31	6	0·73

	0	
	1	1
	0	1
	1	1
	0	1
	1	0
	1	0
	1	0
	1	0
	1	1
	2	1
	1	1
	2	0
	2	0
	2	1
	3	1
	2	1
	3	1

Tab. 8—*Fortsetzung.*

Alter	Personen unter Risiko	Sterbefälle	Sterblichkeitsprocentsätze: Beobachtet	Der Ausgleichung zu Grunde gelegt	Ausgeglichen	δ	δ^2	δ^3	δ^4	Sterblichkeitsprocentsätze nach der graphischen Ausgleichung
45	1877·5	17	91	wie in der vor. Kol.	0·726	37	5	4		0·77
46	1921·5	11	57		0·768	42	5	3	−1	0·80
47	1963·5	16	81		0·815	47	8	4	2	0·84
48	1983	22	1·11		0·870	55	13	6	1	0·90
49	2000	19	0·95		0·938	68	19	7	2	0·97
50	2007	14	0·70		1·025	87	22	9	2	1·06
51	1996	29	1·45		1·134	109	28	11	1	1·17
52	1979	22	1·11		1·271	137	26	12	1	1·29
53	1976·5	21	1·06		1·434	163	20	13	1	1·42
54	1985	40	2·02		1·617	183	8	14	1	1·56
55	1970	35	1·78		1·808	191	−6	15	2	1·71
56	1949	41	2·10		1·993	185	−17	17	2	1·88
57	1919·5	41	2·14		2·161	168	−17	19	1	2·07
58	1885	49	2·60		2·312	151	−7	20	1	2·27
59	1841·5	43	2·34		2·456	144	15	21	2	2·48
60	1805	40	2·22		2·615	159	38	23	2	2·71
61	1783	57	3·20		2·812	197	61	25	1	2·96
62	1715·5	51	2·97		3·070	258	76	26	3	3·22
63	1659	53	3·19		3·404	334	80	29	7	3·51
64	1611	53	3·29		3·818	414	68	36	7	3·87
65	1560·5	69	4·42		4·300	482	46	43	5	4·30
66	1456·5	82	5·63		4·828	528	17	48	4	4·78
67	1344·5	70	5·21		5·373	545	−7	52	5	5·30
68	1240	77	6·21		5·911	538	−14	57	1	5·87
69	1136	69	6·07		6·435	524	−2	58	−1	6·45
70	1040·5	77	7·40		6·957	522	26	57	−3	7·02
71	923	67	7·26		7·505	548	61	54	7	7·56
72	836·5	64	7·65		8·114	609	96	61	13	8·17
73	743	63	8·48		8·819	705	121	74	9	8·91
74	644·5	65	10·09		9·645	826	139	83	9	9·74
75	550	64	11·64		10·61	965	125	92	10	10·66
76	460	48	10·43		11·70	1090	15	102	10	11·68
77	390	47	12·05		12·94	1240	12	112	12	12·80
78	320·5	46	14·35		14·30	1360	13	124	15	14·04
79	258·5	40	15·47		15·79	1490	14	139	17	15·43
80	202	44	21·78		17·42	1630	19	156	19	16·99
81	149·5	26	17·39		19·24	1820	21	175	20	18·74
82	118·5	21	17·72		21·27	2030	23	195	19	20·69
83	85·5	21	24·56		23·53	2260	23	214	18	22·83
84	57	13	22·81		26·02	2490	21	232	17	25·15
85	41·5	16	38·55		28·72	2700	20	249	17	27·64

Summe 75·64

Summe 195·11

Tab. 8—*Fortsetzung.*

Alter	Personen unter Risiko	Sterbefälle	Sterblichkeitsprocentsätze					Sterblichkeitsprocentsätze nach der graphischen Ausgleichung
			Beobachtet	Der Ausgleichung zu Grunde gelegt	Ausgeglichen	δ	δ^2	
86	22	6	27·27	31·67	31·62	290	17	30·30 266 20
87	16	6	37·50	34·82	34·69	307	21	33·16 286 22
88	8	3	37·50	38·28	37·97	328	32	36·24 308 25
89	2·5			42·08	41·57	360	46	39·57 333 27
90	0·5			46·27	45·63	406	61	43·17 360 31
91				50·87	50·30	467	75	47·07 391 32
92				55·92	55·72	542	76	51·30 423 35
93				61·48	61·90	618	64	55·88 458 37
94				67·59	68·72	682	31	60·83 495 39
95				74·31	75·85	713	− 19	66·17 534 42
96				81·69	82·79	694	− 73	71·93 576 46
97				100·00[1] (89·81)	89·00	621	−122	78·15 622 50
98					93·99	499	−145	84·87 672 55
99					97·53	354		92·14 727

Tab. 9.—Abweichungen zwischen wirklichen und rechnungsmässigen Sterbefällen. Versicherte Geistliche, 6. Vers.-Jahr und aufwärts.

Altersklasse	Wirkliche Sterbefälle	Überschuss der rechnungsmässigen über die wirklichen	Akkumulirte Abweichungen	Altersklasse	Wirkliche Sterbefälle	Überschuss der rechnungsmässigen über die wirklichen	Akkumulirte Abweichungen
Neues Verfahren				Graphisches Verfahren			
20–34	10	−0·10	−0·10	26–34	9	0·06	0·06
35–42	58	−0·35	−0·45	35–44	81	−0·16	−0·10
43, 44	23	0·66	0·21	45–51	128	0·19	0·09
45–47	44	0·38	0·59	52–55	118	0·26	0·35
48–52	106	−1·62	−1·03	56–60	214	−0·25	0·10
53–55	96	0·07	−0·96	61–66	365	0·32	0·42
56–63	375	0·63	−0·33	67–71	360	0·14	0·56
64–72	628	−0·91	−1·24	72–75	256	−0·06	0·50
73–76	240	−0·14	−1·38	76–81	251	−0·12	0·38
77–83	245	1·36	−0·02	82–90	86	−0·06	0·32
84–90	44	−0·43	−0·45				
Summe	1869	−0·45			1868	0·32	

Die Ergebnisse sind befriedigend, wenn auch nicht in dem Maase als vorhin, und ich ziehe daraus den Schluss, dass ein Beobachtungsmaterial von mindestens 2,000 gut vertheilten Sterbefällen nöthig ist, wenn die neue Methode sich wirklich lohnen soll.

[1] Zur Vereinfachung der Rechnung und Abkürzung der Tafel wurden die aus der Formel gewonnenen Zahlen von hier ab durch 100·00 ersetzt. Die Abänderung hat die Endwerthe nur wenig beeinflusst.

Die neue Methode setzt ihrer Ableitung nach voraus, dass die auszugleichende Tafel sich überall nach fünfjährigen Intervallen interpoliren lässt und kann daher nicht unmittelbar auf die von der Geburt bis zum etwa fünften Lebensjahre reichende Altersstrecke angewandt werden, innerhalb deren die Kurve der Sterbenswahrscheinlichkeiten einer starken und rasch wechselnden Krümmung unterliegt. Man kann sich aber dadurch helfen, dass man für diese Strecke sowie für die in der Formel auftretenden negativen Alter zunächst eine künstliche Kurve mit Hülfe von Durchschnitte und eine Interpolation 1ster oder 2ter Ordnung aus den für die folgenden 8 oder 10 Jahre gegebenen (unausgeglichenen) Sterbenswahrscheinlichkeiten konstruirt, alsdann die Ausgleichung in gewöhnlicher Weise vornimmt und schliesslich die Differenzen zwischen den künstlichen und wirklichen Sterbenswahrscheinlichkeiten, nach dem diese Differenzen eventuell für sich ausgeglichen sind, hinzusetzt. Ein gleiches Verfahren lässt sich einschlagen, wenn man eine nach der Versicherungsdauer abgestufte "ausgewählte Tafel" ausgleichen will, bei der auch die ersten Jahre ein abnormes Verhalten aufzuweisen pflegen. Es will mich übrigens bedünken, als ob die bisher beliebten Zusammenfassungen einschlägiger Beobachtungen nach fünfjährigen Gruppen von Eintrittsaltern, die als Repräsentanten des mittleren gelten sollen, nicht ganz einwandsfrei sind, weil damit der Einfluss des Alters bez. die Besetzung der Alter innerhalb der Gruppen nur ungenügend berücksichtigt wird und dass man genauere Resultate zu erwarten hätte, wenn die Beobachtungen zunächst nach entsprechend gewählten, theils engen und theils weiteren Versicherungsperioden geschieden und innerhalb dieser nach Altern gruppirt und ausgeglichen würden, wobei die mechanischen Methoden recht gut zu gebrauchen wären. Freilich würde dann immer noch eine definitive Bearbeitung nöthig sein, um glatte Übergänge von einem Versicherungsjahr zum anderen zu erlangen und die Arbeit sich somit ausgängig noch etwas komplicirter als bisher gestalten.

Dass in der That die Zusammenfassung versicherter Leben nach fünfjährigen Gruppen von Beitrittsaltern Bedenken hat, mag an den Chatham'schen Ergebnissen gezeigt werden, die sich bekanntlich auf männliche Versicherte der Gothaer Bank von 1829–78 beziehen und im Band xxix des *Journal of the Institute* veröffentlicht sind. Die in der Übersicht erwähnten Sätze der *einzelnen* Alter sind diejenigen, welche Chatham durch nachträgliche Interpolation aus den für die "mittleren Eintrittsalter" berechneten Sterblichkeitssätzen gewonnen hat.

Die Abweichungen zwischen den aus den Durchschnittssätzen und den aus den definitiven Sätzen hervorgegangenen erwartungsmässigen Sterbefällen sind, wie man sieht, volkommen gesetzmässig und keineswegs bedeutungslos. Für die von Chatham verfolgten Zwecke mag sein Verfahren allerdings genau genug gewesen sein.

TAB. 10.—CHATHAM'S AUSGLEICHUNG DER ERFAHRUNGEN DER GOTHAER BANK FÜR DIE ERSTEN 10 VERSICHERUNGSJAHRE (MÄNNER).

Rechnungsmässige Sterbefälle nach den ausgeglichenen Sätzen der mittleren Beitrittsalter 30, 35, 40, 45, 50 und 55 einerseits und den definitiven Sätzen der einzelnen Beitrittsalter andererseits.

Versicherungsjahr	Beitrittsalter 28–37		38–47		48–57		28–57 (Summe)	
	Sterbefälle nach den Sätzen der mittleren Beitrittsalter 30 & 35	Die definitiven Sätze ergeben mehr (+) weniger (−)	Sterbefälle nach den Sätzen der mittleren Beitrittsalter 40 & 45	Definitive Sätze. Mehr (+) weniger (−)	Sterbefälle nach den Sätzen der mittleren Beitrittsalter 50 & 55	Definitive Sätze. Mehr (+) weniger (−)	Sterbefälle nach den Sätzen der mittleren Beitrittsalter 30, . . . 55	Definitive Sätze. Mehr (+) weniger (−)
1	167·6	1·0	157·3	−0·2	96·4	−1·0	421·3	−0·2
2	196·5	0·6	183·3	−0·3	140·6	−2·0	520·4	−1·7
3	203·2	0·7	194·6	−0·1	150·9	−2·6	548·7	−2·0
4	203·8	1·2	202·6	−0·3	156·4	−2·6	562·8	−1·7
5	200·4	1·8	208·2	−1·2	159·1	−2·5	567·7	−1·9
6	196·4	1·5	212·0	−1·1	161·8	−2·5	570·2	−2·1
7	191·1	1·9	215·1	−1·3	163·5	−2·6	569·7	−2·0
8	187·9	1·6	219·0	−1·6	166·8	−2·5	573·7	−2·5
9	185·6	1·6	224·7	−1·4	171·4	−2·7	581·7	−2·5
10	179·9	0·7	224·4	−1·8	172·8	−2·5	577·1	−3·6
	1912·4	12·6	2041·2	−9·3	1539·7	−23·5	5493·3	−20·2
Wirkliche Sterbefälle	1909	16·0	2041	−9·1	1540	−23·8	5490	−16·9

ANHANG.

Die Korrektionsrechnung zwischen der 1sten und 2ten Ausgleichung, bisher durch Tab. 5 erläutert, wird nicht unbedeutend erleichtert, wenn man sich der am Schlusse mitgetheilten Hülfstafel bedient. Dieselbe hat innerhalb des ersten Rahmens zunächst die Einrichtung einer gewöhnlichen 3stelligen Logarithmentafel mit dem Unterschiede, dass gewisse Mantissen ganz oder theilweise unterstrichen sind, wodurch eine genauere Bestimmung des Numerus bei gegebenem Logarithmus ermöglicht wird. Sind nämlich mehrere aufeinander folgende Mantissen einander gleich, so ist diejenige ganz unterstrichen, welche den genauesten Numerus giebt, und ist die Differenz zweier auf einander folgender Mantissen eine grade, so ist die erste bez. letzte Ziffer derjenigen unterstrichen, welche am genauesten den Numerus der in der Mitte liegenden Mantisse giebt.

Beispielsweise findet man

zum Logarithmus 1·952 als Numerus 89·5
„ „ 2·536 „ „ 344
„ „ 0·066 „ „ 1·16

und es wird auf diese Weise die bei 3- und 4stelligen Logarithmen sonst übliche Antilogarithmentafel erspart, die bei der ungewohnten Anordnung von Numeri und Mantissen leicht zu Irrthümern Veranlassung giebt.

Der innerhalb des zweiten Rahmens liegende Theil bildet gewisser-

massen eine Tafel für sich und kann zunächst dazu benutzt werden, um zu jeder vorgelegten 3stelligen Zahl die Ergänzung zu 1,000 zu finden. Die rechts stehenden Zahlen in altenglischer Schrift ergänzen nämlich die links befindlichen Numeri zu 100 und die in der ersten und zweiten Horizontalzeile aufgeführten Zahlen ergänzen sich wieder zu 10, so dass man beispielsweise als Ergänzung von 334, 666 hat. Ein vorgesetztes ρ bedeutet aber nichts anderes als eine negative Einheit der betreffenden Stelle, und es ergänzen sich daher die numeri und die neu eingeführten Zahlen in Wirklichkeit nicht zu 1,000, sondern zu 0, wie aus den folgenden Beispielen hervorgeht.

$$\text{Ergänzung von } 278 = \rho\ 722 \left(\text{wegen } \frac{^{-1}722}{=-278}\right)$$

$$\text{Ergänzung von } 431 = \rho\ 569 \left(\text{wegen } \frac{^{-1}431}{=-569}\right)$$

Der eigentliche Werth der letztgenannten Einrichtung beruht nun darauf, dass man zu jedem vorgelegten Logarithmus auch unmittelbar die zugehörige Ergänzung der Numerus ablesen und ebenso zu einer vorgelegten Ergänzung den Logarithmus des zugehörigen Numerus ablesen kann, wodurch negative Zwischenrechnungen vermieden werden. Sind z. B. die Logarithmen 2·455 und 2·984 gegeben und man weiss, dass sie sich auf negative Numeri beziehen, so giebt die Tafel für diese ρ 715 und ρ 036 und wenn hierzu 481, 543 und 621 hinzugefügt werden sollen, so lautet die Rechnung nunmehr:

	ρ 715
	ρ 036
	481
	543
	621
Addirt:	396

indem die bei der Addition in der ersten Stelle erscheinende 2 sich gegen 2ρ oder -2 aufhebt. Hat man ferner Zahlen von einander abzuziehen, wobei der Subtrahendus zuweilen grösser und zuweilen kleiner ist als der Minuendus, und sind von diesen Zahlen wieder Logarithmen zu nehmen, so rechnet man einfach so

627	421	27	(oder 027)
-961	266	-172	
ρ 666	155	ρ 855	

und liest dann die zugehörigen Logarithmen aus der Tafel ab, indem man den Eingang, je nachdem ρ vorgesetzt ist oder nicht, auf der rechten oder linken Seite wählt.

Bei der Rechnung mit den Ergänzungen und dem Zeichen ρ sind einige Regeln zu beachten, die sich aus der Bedeutung des letzteren von selbst ergeben. Man kann bei einer Zahl mit vorgesetztem ρ immer hinter dem ρ beliebig viele Neunen einschalten, beispielsweise ist

$$\rho\ 782 = \quad \rho\ 9782 = \rho\ 99782$$

und

$$0.0\rho 782 = 0.\rho 9782 = \rho.99782 = \rho 9{,}99782$$

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Bei der Bestimmung der Kennziffer einer Zahl mit vorgesetztem ρ zählen weder ρ noch die auf ρ folgenden Neunen, insoweit sie vor dem Decimalzeichen stehen, hinter dem Decimalzeichen aber als Nullen, und andererseits gelten die auf ρ folgenden Nullen immer als Stellen, so dass also

die Kennziffer von $\rho 9978.23 = 1$ ist
„ „ „ $\rho 99.9937 = 7\ (-10)$
„ „ „ oder $= \bar{3}$ nach englischer Schreibweise
„ „ „ $0.000\rho 7 = 5\ (-10)$ oder $\bar{5}$
„ „ „ $0.000\rho 992 = 3\ (-10)$ „ $\bar{7}$
„ „ „ $\rho 0.8 = 0$
„ „ „ $0.00\rho 002 = 6\ (-10)$ oder $\bar{4}$

Eine dritte Regel, die bei der Verdoppelung von Zahlen mit vorgesetztem ρ (Multiplikation mit 0.2 an Stelle der Division mit 5) zuweilen zur Anwendung kommt, ist die, dass -2ρ durch $\rho 8$ ersetzt werden kann.

In welcher Weise sich die Korrektionsrechnung mit dem neuen Hülfsmittel gestaltet, zeigt das folgende Beispiel, das sich auf die H^{M}(5) Tafel und die hier durchgeführte 1sten Ausgleichung nach Higham'scher Methode bezieht. Sie sieht auf den ersten Blick etwas umständlich aus, was davon herrührt, dass alle Operationen vollständig wiedergegeben sind einschliesslich derjenigen, welche die Abweichungen zwischen rechnungsmässigen und wirklichen Sterbefällen ergeben. In Wirklichkeit ist die Rechnung aber ungemein leicht und rasch zu bewerkstelligen, wie ein Versuch nach einiger Ubung bestätigen wird.

TAB. 11.—KORREKTION DER 1STEN AUSGLEICHUNG. $H^{M(5)}$.

Alter	Sterblichkeitsprocentsätze: Beobachtet, $100\,q_x$	Sterblichkeitsprocentsätze: 1ste Ausgleichung, $100.\,q_x$ 1)	(a) $100\,(q_x - q_x(1))$	(b) log. $100\,(q_x - q_x(1))$	L_x	(c) log. $\frac{L_x}{100}$	$b+c$ oder log. Z_x	(d) Z_x	ΣZ_x	(e) log. ΣZ_x	ΣL_x	(f) log. $\frac{\Sigma L_x}{100}$	$e-f$ oder log. $\frac{100\,.\,\Sigma Z_x}{\Sigma L_x}$ $= \log. 100 k_x$	$100 k_x$	Mittel oder $100 k_x(1)$	$100 q_x(2)$ $= 100\,(q_x(1) + k_x(1))$
30	1·046	0·923	0·123	9·090 [1]	84·1	1·925	1·015	10·4								
31	0·913	919	0.0ρ4	7·778	102	2·009	9·787	ρ·4								
32	0·835	919	0·ρ16	8·924	121	2·083	1·007	ρ89·8	8·1	0·908	605	2·782	8·126	0·013		
33	0·891	925	0·ρ66	8·531	139	2·143	0·674	ρ5·3	ρ75·7	1·386	696	2·843	8·543	0·ρ65		
34	1·035	952	0·083	8·919	159	2·201	1·120	13·2	ρ83·9	1·207	784	2·894	8·313	0·ρ79	0·0ρ6	0·948
35	0·870	996	ρ·874	9·100	175	2·243	1·343	ρ78·0	3·2	0·505	866	2·938	7·567	0·004	0·0ρ4	0·990
36	1·077	1·037	0·040	8·602	190	2·279	0·881	7·6	17·1	1·233	943	2·975	8·258	0·018		
37	1·118	073	0·045	8·653	203	2·307	0·960	9·1	5·3	0·724	101·	3·004	7·720	0·005		
38	1·145	102	0·043	8·633	216	2·334	0·967	9·2								
39	1·127	121	0·006	7·778	226	2·354	0·132	1·4								

Wenn Logarithmen sich, wie die in Kol. log Z_x, theilweise auf gewöhnliche Numeri und theilweise auf Ergänzungszahlen beziehen, muss man immer die Entstehungsweise derselben im Auge haben. Das ist etwas lästig und es empfiehlt sich vielleicht deshalb, jedem Logarithmus, der sich auf eine Ergänzungszahl bezieht, in bestimmter Weise, etwa durch einen angehängten Buchstaben, zu bezeichnen.

(Hülfstafel).

[1] Nach englischer Schreibweise $\bar{1}$·090.

N.	L. 0	1	2	3	4	5	6	7	8	9		
		9	8	7	6	5	4	3	2	1	0	
10	000	004	009	013	017	021	025	029	033	037	041	ρ 89
11	041	045	049	053	057	061	064	068	072	076	079	ρ 88
12	079	083	086	090	093	097	100	104	107	111	114	ρ 87
13	114	117	121	124	127	130	134	137	140	143	146	ρ 86
14	146	149	152	155	158	161	164	167	170	173	176	ρ 85
15	176	179	182	185	188	190	193	196	199	201	204	ρ 84
16	204	207	210	212	215	217	220	223	225	228	230	ρ 83
17	230	233	236	238	241	243	246	248	250	253	255	ρ 82
18	255	258	260	262	265	267	270	272	274	276	279	ρ 81
19	279	281	283	286	288	290	292	294	297	299	301	ρ 80
20	301	303	305	307	310	312	314	316	318	320	322	ρ 79
21	322	324	326	328	330	332	334	336	338	340	342	ρ 78
22	342	344	346	348	350	352	354	356	358	360	362	ρ 77
23	362	364	365	367	369	371	373	375	377	378	380	ρ 76
24	380	382	384	386	387	389	391	393	394	396	398	ρ 75
25	398	400	401	403	405	407	408	410	412	413	415	ρ 74
26	415	417	418	420	422	423	425	427	428	430	431	ρ 73
27	431	433	435	436	438	439	441	442	444	446	447	ρ 72
28	447	449	450	452	453	455	456	458	459	461	462	ρ 71
29	462	464	465	467	468	470	471	473	474	476	477	ρ 70
30	477	479	480	481	483	484	486	487	489	490	491	ρ 69
31	491	493	494	496	497	498	500	501	502	504	505	ρ 68
32	505	507	508	509	511	512	513	515	516	517	519	ρ 67
33	519	520	521	522	524	525	526	528	529	530	531	ρ 66
34	531	533	534	535	537	538	539	540	542	543	544	ρ 65
35	544	545	547	548	549	550	551	553	554	555	556	ρ 64
36	556	558	559	560	561	562	563	565	566	567	568	ρ 63
37	568	569	571	572	573	574	575	576	577	579	580	ρ 62
38	580	581	582	583	584	585	587	588	589	590	591	ρ 61
39	591	592	593	594	595	597	598	599	600	601	602	ρ 60
40	602	603	604	605	606	607	609	610	611	612	613	ρ 59
41	613	614	615	616	617	618	619	620	621	622	623	ρ 58
42	623	624	625	626	627	628	629	630	631	632	633	ρ 57
43	633	634	635	636	637	638	639	640	641	642	643	ρ 56
44	643	644	645	646	647	648	649	650	651	652	653	ρ 55
45	653	654	655	656	657	658	659	660	661	662	663	ρ 54
46	663	664	665	666	667	667	668	669	670	671	672	ρ 53
47	672	673	674	675	676	677	678	679	679	680	681	ρ 52
48	681	682	683	684	685	686	687	688	688	689	690	ρ 51
49	690	691	692	693	694	695	695	696	697	698	699	ρ 50
50	699	700	701	702	702	703	704	705	706	707	708	ρ 49
51	708	708	709	710	711	712	713	713	714	715	716	ρ 48
52	716	717	718	719	719	720	721	722	723	723	724	ρ 47
53	724	725	726	727	728	728	729	730	731	732	732	ρ 46
54	732	733	734	735	736	736	737	738	739	740	740	ρ 45

N.	L. 0	1	2	3	4	5	6	7	8	9		
		9	8	7	6	5	4	3	2	1	0	
55	740	741	742	743	744	744	745	746	747	747	748	ρ 44
56	748	749	750	751	751	752	753	754	754	755	756	ρ 43
57	756	757	757	758	759	760	760	761	762	763	763	ρ 42
58	763	764	765	766	766	767	768	769	769	770	771	ρ 41
59	771	772	772	773	774	775	775	776	777	777	778	ρ 40
60	778	779	780	780	781	782	782	783	784	785	785	ρ 39
61	785	786	787	787	788	789	790	790	791	792	792	ρ 38
62	792	793	794	794	795	796	797	797	798	799	799	ρ 37
63	799	800	801	801	802	803	803	804	805	806	806	ρ 36
64	806	807	808	808	809	810	810	811	812	812	813	ρ 35
65	813	814	814	815	816	816	817	818	818	819	820	ρ 34
66	820	820	821	822	822	823	823	824	825	825	826	ρ 33
67	826	827	827	828	829	829	830	831	831	832	833	ρ 32
68	833	833	834	834	835	836	836	837	838	838	839	ρ 31
69	839	839	840	841	841	842	843	843	844	844	845	ρ 30
70	845	846	846	847	848	848	849	849	850	851	851	ρ 29
71	851	852	852	853	854	854	855	856	856	857	857	ρ 28
72	857	858	859	859	860	860	861	862	862	863	863	ρ 27
73	863	864	865	865	866	866	867	867	868	869	869	ρ 26
74	869	870	870	871	872	872	873	873	874	874	875	ρ 25
75	875	876	876	877	877	878	879	879	880	880	881	ρ 24
76	881	881	882	883	883	884	884	885	885	886	886	ρ 23
77	886	887	888	888	889	889	890	890	891	892	892	ρ 22
78	892	938	893	894	894	895	895	896	897	897	898	ρ 21
79	898	898	899	899	900	900	901	901	902	903	903	ρ 20
80	903	904	904	905	905	906	906	907	907	908	908	ρ 19
81	908	909	910	910	911	911	912	912	913	913	914	ρ 18
82	914	914	915	915	916	916	917	918	918	919	919	ρ 17
83	919	920	920	921	921	922	922	923	923	924	924	ρ 16
84	924	925	925	926	926	927	927	928	928	929	929	ρ 15
85	929	930	930	931	931	932	932	933	933	934	934	ρ 14
86	934	935	936	936	937	937	938	938	939	939	940	ρ 13
87	940	940	941	941	942	942	943	943	943	944	944	ρ 12
88	944	945	945	946	946	947	947	948	948	949	949	ρ 11
89	949	950	950	951	951	952	952	953	953	954	954	ρ 10
90	954	955	955	956	956	957	957	958	958	959	959	ρ 09
91	959	960	960	960	961	961	962	962	963	963	964	ρ 08
92	964	964	965	965	966	966	967	967	968	968	968	ρ 07
93	968	969	969	970	970	971	971	972	972	973	973	ρ 06
94	973	974	974	975	975	975	976	976	977	977	978	ρ 05
95	978	978	979	979	980	980	980	981	981	982	982	ρ 04
96	982	983	983	984	984	985	985	985	986	986	987	ρ 03
97	987	987	988	988	989	989	989	990	990	991	991	ρ 02
98	991	992	992	993	993	993	994	994	995	995	996	ρ 01
99	996	996	997	997	997	998	998	999	999	000		ρ 00

Translation.

On a New Mechanical Method of Graduation.

By Dr. Johannes Karup.

There is at present great diversity of opinion among actuaries as to the most suitable method of graduating Tables of Mortality, and similar statistical observations. While one gives preference to the graphic method, and another to a mechanical formula for graduation, such as Woolhouse's, a third takes as the basis of his calculations an analytical law, such as that shown in the Gompertz-Makeham formula. But all the more modern methods have the following tendency in common—only to depart from the original observations in those cases in which clearly accidental variations of the true curve are apparent, and, on the other hand, to arrive at the final results as regularly as if they really had arisen from the application of an analytical law. This tendency considerably narrows the margin within which any valid systems can vary, and hence we find that the results of various good systems of graduation differ but slightly, and certainly much less so than anyone inexperienced in the subject generally would suppose.

If an analytical law were known, to which mortality conformed under all circumstances, it would clearly be the right thing to undertake graduation according to that law, and to settle the constants which arose out of the observations by the method of least squares. But such a law has not yet been discovered, and will be discovered, if ever, only with great difficulty, since the causes of death are of a very complicated nature, and are in a continual state of change; and all analytical methods of graduation are therefore only of value as attempts which may appear satisfactory or not, after the event. But the more actuarial science advances, and the materials for observations increase, the more generally will it be desirable to investigate and determine the rate of mortality, not merely according to age and sex, but also with regard to duration of assurance, description of assurance, and other circumstances; and the greater will be the difficulties which stand in the way of an analytical treatment of the problem. I believe, therefore, that the time when it will be sought to graduate the experience of Life Asssurance Offices by means of an analytical formula, such as the Gompertz-Makeham, is well nigh past, and that in the future we shall avail ourselves almost entirely of purely mechanical formulæ, which can be applied to any curves, or of the graphic method. Gompertz' formula will not thereby lose its value. It will continue to prove of great use, as Sorley has already emphasized,

in the case of many theoretical investigations, and in the calculation of values founded on complicated observations. Nor will it be superfluous to seek to discover new analytical expressions for the law of mortality, as in this manner many a valuable addition to practice and theory is possible, which has no connection with the problem of graduation.

Woolhouse's system of graduation, which was first tried in the Tables of the twenty English offices, has in its time met with great approval; and up to the present day possesses numerous adherents. In fact, this system excels all the earlier mechanical methods of graduation, both in a theoretical and a practical aspect; for while these consisted chiefly of simple averages or interpolations by which the materials were made use of in a very irregular manner, Woolhouse's has regard to the true, though unknown, curve of the function entering into the question, and takes into consideration for each point an equal number of symmetrically arranged observation values. By these means the calculations are simplified, especially if we make use of the system as improved by Ackland or Higham, and the correspondence with the observed facts is highly satisfactory, whether we consider the numbers of the living in the Table of Decrements or compare the estimated and actual number of deaths. The only thing remaining to be desired is regularity in the results, and we are therefore gratified that Higham has published formulæ which, while resembling those of Woolhouse, have this failing to a much more limited extent. Strange to say, Higham's discoveries have attracted comparatively little attention, which may, perhaps, be accounted for on the one hand by the fact that their theoretical foundation is not so simple and easily seen through as Woolhouse's, but must also in part be ascribed to the circumstance that in the meantime the graphic method had come more to the front. For while the opinion was formerly universal that this method was especially suitable for observations of small dimensions, Sprague has lately demonstrated by a prominent example, the $H^M(5)$ Table, that it can also lead to excellent results in cases where large numbers are involved, if the curve is drawn with some skill and amended from time to time with regard to the real and estimated number of deaths. By this means a wide field of experiment was opened up to the graphic method, and Sprague will certainly not want for imitators, as the valuable labours of Chatham already prove.

The graphic method, however, has its weak points as well as Woolhouse's. The deficiencies of the former are, first, that it pre-supposes a certain skill in drawing which every actuary does not possess, and further, that it leaves to the judgment of the calculator how far any existing variation in the mortality is to be looked upon as arising from some law, and so far adhered to, or not. Sprague certainly sees an advantage in this circumstance, and it is decidedly so, when we have very scanty materials to deal with, and can only obtain a correct idea of the true curve by means of a comparison with other and more extensive observations. But in the case of observations where the materials are plentiful, we should give the preference in every case to a graduation which depended upon these materials only, and obtained the desired regularity without either artificial or varied grouping of the observations.

I believe, therefore, that the following investigations concerning a new mechanical method which satisfies *all* the demands made on a good system of graduation, will not be without interest. Certainly this method is not suitable for observations where the numbers are small. For such the graphic method, together with a purely analytical one (I am reminded of Makeham's investigations in the 16th volume of the *Journal of the Institute of Actuaries*), will be the only one suitable.

The new procedure consists of three separate operations: A provisional graduation of the given probabilities of death, according to a simple mechanical formula; a subsequent correction on the basis of the estimated and actual deaths, and a definite graduation, in which a new function, the logarithm of the probability of death, is introduced. The regularity of the results is increased by the repeated graduation, especially as the second graduation is undertaken according to a formula which graduates much more accurately than any hitherto known, while the correction, according to the actual and estimated deaths, ensures that individual observations shall have their due weight, and that in spite of the combined operations, we do not depart too far from the original observations. As we are aware, a consideration of the importance of the actual facts was not provided for either by Woolhouse or Higham, and numerous objections have been made to their method on this account. The new method, therefore, obviates an objection of this kind in advance, and further, as will be shown, reduces the theoretical error which Sprague has proved to attach to Woodhouse's method, to a small fraction of the same, and thereby removes all foundation for the last objection against mechanical methods of graduation which up to the present has been held to be valid.

I shall proceed immediately to work out the formula which is used in the second graduation. But, for this purpose, a few preliminary investigations are necessary, which will be treated in sections 1 and 2.

1. Osculatory Interpolations.

It is known that the idea underlying Woolhouse's system is that we can deduce from the ungraduated numbers living of the mortality tables n new tables, if for each successive one we take only intervals of n years into consideration, alter the intervals from table to table by 1 year, and fill in by interpolation the missing terms of the single years in each table of n years. The tables constructed in this manner can be regarded as so many approaches to the true arrangement of the number of deaths, and Woolhouse constructs his final table by taking the arithmetical mean of these numbers.

That the numbers of the living at each year of life, as well as the consequent probabilities of death, can be deduced with a fair amount of accuracy from values which are given for longer intervals by the assistance of interpolation, is shown by every normal Table of Mortality which is even moderately graduated; and therefore we see that Woolhouse's principle is not wanting for a theoretical foundation. It may not, however, be known that the derivation of the average from the standpoint of the calculation of probability is a direct

consequence of interpolation. The proof of this is not difficult. Let us assume with Woolhouse that an interpolation in intervals of five years with second central differences is sufficient. We then obtain, as theoretical values of the graduated function ϕ for the space from -7 to 7 :

$$\phi_{-7}=\phi_{-5}-\frac{2}{5}\cdot\frac{\phi_0-\phi_{-10}}{2}+\frac{4}{50}\cdot(\phi_0-2\phi_{-5}+\phi_{-10})$$

$$\phi_{-6}=\phi_{-5}-\frac{1}{5}\cdot\frac{\phi_0-\phi_{-10}}{2}+\frac{1}{50}\cdot(\phi_0-2\phi_{-5}+\phi_{-10})$$

$$\phi_{-5}=\phi_{-5}$$

$$\phi_{-4}=\phi_{-5}+\frac{1}{5}\cdot\frac{\phi_0-\phi_{-10}}{2}+\frac{1}{50}\cdot(\phi_0-3\phi_{-5}+\phi_{-10})$$

$$\phi_{-3}=\phi_{-5}+\frac{2}{5}\cdot\frac{\phi_0-\phi_{-10}}{2}+\frac{4}{50}\cdot(\phi_0-2\phi_{-5}+\phi_{-10})$$

$$\phi_{-2}=\phi_0\ -\frac{2}{5}\cdot\frac{\phi_5-\phi_{-5}}{2}+\frac{4}{50}\cdot(\phi_5-2\phi_0+\phi_{-5})$$

$$\phi_{-1}=\phi_0\ -\frac{1}{5}\cdot\frac{\phi_5-\phi_{-5}}{2}+\frac{1}{50}\cdot(\phi_5-2\phi_0+\phi_{-5})$$

$$\phi_0\ =\phi_0$$

$$\phi_1\ =\phi_0\ +\frac{1}{5}\cdot\frac{\phi_5-\phi_{-5}}{2}+\frac{1}{50}\cdot(\phi_5-2\phi_0+\phi_{-5})$$

$$\vdots$$

$$\phi_7\ =\phi_5\ +\frac{2}{5}\cdot\frac{\phi_{10}-\phi_0}{2}+\frac{4}{50}\cdot(\phi_{10}-2\phi_5+\phi_0)$$

Now it is known that we obtain the best or most probable values of the constants included in a function (the equal importance of each being understood) by taking the differences between the theoretical and actually observed values, squaring and summing them, and settling the constants, to which in this case ϕ belongs, so that their sum becomes a minimum. But if we perform these operations, and differentiate according to ϕ, we obtain, after a few transformations, the following equation :—

$$\phi-\frac{54}{3125}\cdot\Delta^4\phi_{-10}=\frac{1}{125}\cdot(25l+24l_1+21l_2+7l_3+3l_4-2l_6-3l_7$$
$$+24l_{-1}+21l_{-2}+7l_{-3}+3l_{-4}-2l_{-6}-3l_{-7})$$

In this equation l, l_1, l_{-1}, ... stand for the observations which are to be graduated, $\Delta^4\phi_{-10}$ is the fourth difference of ϕ_{-10}, ϕ_{-5}, ϕ, ϕ_5, ϕ_{10}, so that $\frac{54}{3125}\Delta^4$. may, for the most part, be neglected as compared with ϕ, and the right side turns out to be nothing else than Woolhouse's final formula. Hence it is proved that Woolhouse's mean curve gives, in fact, the best result which can be obtained on the basis of the accepted interpolation.

The interval of five years would appear to be the most suitable one that can be chosen, since the calculations with other intervals

are inconvenient, or lead to an unsatisfactory graduation. The irregularities which remain after the use of Woolhouse's method are not largely due to the fact that the interval selected is too small, but arise through Woolhouse having gone no farther than second central differences. If we proceed to third and fourth differences a better result is at once obtained. But even an interpolation of this description, if undertaken in the usual manner, will, in the primary tables out of which the final one is constructed, show sudden variations wherever a change in the observed facts occurs, and I therefore prefer such a system as Sprague has published in his excellent essay entitled, "Explanation of a New Formula," &c. *J.I.A.*, vol. xxiii, p. 270). This process is founded, to put it briefly, upon the following reasoning: If we have to interpolate in a series of values y_{-1}, y_0, y_1, y_2 . . . &c., which do not conform to any simple law, we can immediately determine for each given point the first and second derivatives appertaining to it from the value in question itself, and the two preceding and two following ones, on the supposition that a parabolic curve of the fourth degree be laid out through these points. Then we interpolate from interval to interval by making use of a curve of the fifth degree which in its first and last points coincides with the values originally given, and whose derivatives coincide in just these points with those already calculated. In carrying out these operations theoretically Sprague finally obtains a formula of interpolation of the fifth degree which, by the application of central differences for the interval from $x=0$ to $x=1$, may be thus rendered:—

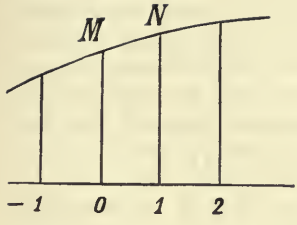
$$y_x = y_0 + x\Delta y_0 + \frac{x(x-1)}{2}\cdot\Delta^2 y_{-1} + \frac{(x+1)x(x-1)}{2.3}\cdot\Delta^3 y_{-1}$$

$$+ \frac{(x+1)x(x-1)(x-2)}{2.3.4}\cdot\Delta^4 y_{-2} + \frac{x^3(x-1)(5x-7)}{2.3.4}\cdot\Delta^5 y_{-2}, \quad . \quad . \quad . \quad (1)$$

in which the differences $\Delta, \Delta^2, \ldots$ are to be calculated in a well-known manner, according to this system:—

y_{-2}					
	Δy_{-2}				
y_{-1}		$\Delta^2 y_{-2}$			
	Δy_{-1}		$\Delta^3 y_{-2}$		
y_0		$\Delta^2 y_{-1}$		$\Delta^4 y_{-2}$	
	Δy_0		$\Delta^3 y_{-1}$		$\Delta^5 y_{-2}$
y_1		$\Delta^2 y_0$		$\Delta^4 y_{-1}$	
	Δy_1		$\Delta^3 y_0$		
y_2		$\Delta^2 y_1$			
	Δy_2				
y_3					

This process yields very good results, as Sprague has shown himself, but can hardly be considered of great value, because it takes too many differences into account, and the calculation is thereby complicated. I have, therefore, while retaining Sprague's main idea, devised a new formula, which only takes account of the derivatives of the first degree, and leads to an interpolation of the third degree. The derivation of this formula is as follows:—



We have simultaneously

$$\frac{y_1-y_{-1}}{2} = y_0' + \frac{1}{1.2.3}\cdot y_0''' + \ldots$$

$$\frac{y_2-y_0}{2} = y_1' - \frac{1}{1.2.3}\cdot y_1''' + \ldots$$

from which follows, if differences of the 2nd order only are taken into consideration,

$$\left.\begin{aligned} y_0' &= \frac{y_1-y_{-1}}{2} = \frac{\Delta_0+\Delta_{-1}}{2} = \Delta_0 - \frac{\Delta^2_{-1}}{2} \\ y_1' &= \frac{y_2-y_0}{2} = \frac{\Delta_1+\Delta_0}{2} = \Delta_0 + \frac{\Delta_0^2}{2} \end{aligned}\right| \quad . \quad (a)$$

If the function represented by the curve MN is to coincide in the points 0 and 1 with y_0 and y_1, and their derivatives are also to coincide in these points with y_0' and y_1' as arrived at, it must be of the third degree at least. We therefore apply the indefinite form

$$y_x = (1-x)^2.[A_0+A_1x] + x^2.[B_0+B_1(1-x)] \quad . \quad . \quad . \quad (b)$$

which, as may easily be seen, is capable of expressing any desired rational integral function of the third degree, and we now obtain

$$y_x' = -2(1-x).[A_0+A_1x] + (1-x)^2.A_1 + 2x[B_0+B_1(1-x)] - x^2B_1 \quad . \quad (b_1)$$

For $x=0$ and $x=1$ (b) and (b_1) give

$$\begin{aligned} y_0 &= A_0 \\ y_1 &= B_0 \\ y_0' &= -2A_0 + A_1 \\ y_1' &= 2B_0 - B_1 \end{aligned} \qquad \text{or} \quad \begin{aligned} A_0 &= y_0, \quad A_1 = y_0' + 2y_0 \\ B_0 &= y_1, \quad B_1 = -y_1' + 2y_1 \end{aligned}$$

and we also have

$$y_x = (1-x)^2.[(1+2x)y_0 + xy_0'] + x^2[(3+2x).y_1 - (1-x).y_1']$$

or

$$\begin{aligned} y_x = {} & (1-3x^2+2x^3)y_0 + (3x^2-2x^3)y_1 \\ & + x(1-x)^2.y_0' - x^2.(1-x).y_1' \end{aligned}$$

If we insert herein the expressions under (a), the following is the final result after a few transformations:

$$y_x = y_0 + x\Delta y_0 + \frac{x(x-1)}{2}\cdot\Delta^2 y_{-1} + \frac{x^2(x-1)}{2}\cdot\Delta^3 y_{-1} \quad . \quad (2)$$

in which the formula which we have been seeking, suitable for the interval $x=0$ to $x=1$, is discovered.

For the ordinary central interpolation of the fifth degree the formula is—

$$\begin{aligned} y_x = {} & y_0 + x\Delta y_0 + \frac{x(x-1)}{2}\cdot\Delta^2 y_{-1} + \frac{(x+1)x(x-1)}{2.3}\cdot\Delta^3 y_{-1} \\ & + \frac{(x+1)x(x-1)(x-2)}{2.3.4}\cdot\Delta^4 y_{-2} + \frac{(x+2)(x+1)x(x-1)(x-2)}{2.3.4.5}\cdot\Delta^5 y_{-2} \end{aligned}$$

and this is also suitable for the fourth or third degree, &c., if we leave out the last, or the two last, terms, &c. We see, therefore, that

the new formulæ are only distinguished from the ordinary ones in the last term, which is easily understood if we take into consideration the mode of construction of the former. For whenever the values $y_{-2}, y_{-1}, y_0, y_1, y_2, y_3$ conform to one and the same curve of the fourth degree, Sprague's interpolation must evidently coincide with the ordinary one of the fourth degree, and a similar connection exists between the new formula (2) and the ordinary one for central interpolation of the second degree.

The preceding curves from the formulæ (2) and (1) have this property, that they not only conform exactly to those of the next interval at the points of commencement and ending, but have also the same derivatives of the first, as well as the first and second order. According to the analogy of an expression made use of in astronomical science, we can reasonably describe the new interpolation, in contradistinction to the ordinary system as *osculatory*.

As a corollary it is also worth while to express the formula of interpolation of which we have made use in Woolhouse's graduation by means of the differences Δ and Δ^2 . . . &c. It runs as follows:—

$$y = y_0 + x\Delta y_0 + \frac{x(x-1)}{2} \cdot \Delta^2 y_{-1} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3)$$

and, indeed, unlike the earlier formula, it is available for the interval $x = -\frac{1}{2}$ to $x = \frac{1}{2}$.

2. Interpolation by Continued Variation of the last Column of Differences.

Woolhouse's principle for the derivation of the mean, which will also be adopted in this system, can easily be applied to formula (2), but the expressions arising from the use of this formula are not practical, and we therefore apply ourselves to some further investigations concerning interpolation.

When we have to insert, not an isolated value, but a whole series of values for regular and equal intervals, we generally, in the ordinary interpolation, adopt a plan in which the principal differences Δ are not made use of, but the differences of the sub-divided interval δ are utilized. The leading differences of this latter kind can easily be derived from the given differences Δ, and as in an interpolation of the nth degree the nth difference always remains constant so long as no new values in the main column come into question, the calculation is finally reduced to a continuous addition of all the differences. Under some circumstances this method can be advantageously made use of even where δ^n is not constant, and, as a matter of fact, Sprague has employed it in the osculatory interpolation which he introduced. But in any case the calculation becomes very laborious by reason of the fact that, at each variation in the original values, we have to calculate anew, not only the differences δ^n, but also those appertaining to the resulting δ, δ^2, . . . δ^{n-1}. A method, therefore, which limits the operations to a calculation of the resulting differences δ for the *first* values of y, and a successive correction of the last column of differences only (with the summation following this process) must be considered as a real improvement. Such a method is now, however, actually possible, if not always practicable, and,

fortunately, it is especially practicable when we are dealing with osculatory interpolation. It is also eminently suitable for the ordinary interpolation, whenever the latter does not go beyond the third degree, while in interpolations of a higher order coefficients of several digits generally make their appearance, and by this means the calculation which does not admit of a contraction of the number of places is again rendered difficult.

The new process may be explained by formula (2). Suppose it is desired to divide the original interval into five parts, and let $x=\frac{k}{5}$, $y_x=u_{5k}$, so that from the given column

$$\ldots\ y_{-1} \qquad\qquad y_0 \qquad\qquad y_1\ \ldots$$

we can deduce the new one

$$\ldots\ u_{-5}\ u_{-4} \qquad \ldots\ u_{-1}\ \ u_0\ \ u_1\ \ldots\ u_4\ \ u_5\ \ldots$$

then we can give it this form:

$$u_k=u_0+k\cdot\frac{\Delta u_0}{5}+\frac{k(k-5)}{2}\cdot\frac{\Delta^2 u_{-5}}{5^2}+\frac{k^2(k-5)}{2}\cdot\frac{\Delta^3 u_{-5}}{5^3} \quad . \quad (2')$$

in which it is to be observed that the differences Δ now refer to intervals of five years instead of one year. The formula is valid for the interval 0 to 5, and to obtain that for the following interval of 5 to 10 it is only necessary to increase all the indices by 5. But now $u_5=u_0+\Delta u_0$, $\Delta u_5=\Delta u_0+\Delta^2 u_0=\Delta u_0+\Delta^2 u_{-5}+\Delta^3 u_{-5}$, $\Delta^2 u_0=\Delta^2 u_{-5}+\Delta^3 u_{-5}$, &c., and the final result for the interval 5 to 10 is the following formula:

$$u_{k+5}=u_0+(k+5)\cdot\frac{\Delta u_0}{5}+\frac{(k+5)k}{2}\cdot\frac{\Delta^2 u_{-5}}{5^2}+\frac{(k^2+25)k}{2}\cdot\frac{\Delta^3 u_{-5}}{5^3}$$
$$+\frac{k^2(k-5)}{2}\cdot\frac{\Delta^4 u_{-5}}{5^3} \quad . \quad . \quad (2'')$$

in which, with the exception of $\Delta^4 u_{-5}$, only the same differences appear as in (2').

Now if in (2') we take successively $k=0, 1, 2, 3, 4, 5$; and in (2'') (which with the value $k=5\ldots$ coincides with (2')) $k=1, 2\ldots 4$, we obtain $u_0, u_1, u_2, \ldots u_{10}$, and if we derive from these quantities another first, second, and third column of differences, the following system is produced, in which, for the sake of brevity, $\frac{\Delta^q u_p}{5^q}=d_p^q$ is universally assumed.

Principal Column	Column of First Differences
$\underline{u_0}$	
$u_1=u_0+\ d_0-\ 2d^2_{-5}-\ 2d^3_{-5}$	$d_0-2d^2_{-5}-\ 2d^3_{-5}$
$u_2=u_0+\ 2d_0-\ 3d^2_{-5}-\ 6d^3_{-5}$	$d_0-\ d^2_{-5}-\ 4d^3_{-5}$
$u_3=u_0+\ 3d_0-\ 3d^2_{-5}-\ 9d^3_{-5}$	$d_0\ \ -\ 3d^3_{-5}$
$u_4=u_0+\ 4d_0-\ 2d^2_{-5}-\ 8d^3_{-5}$	$d_0+\ d^2_{-5}+\ d^3_{-5}$
$\underline{u_5}=u_0+\ 5d_0$	$d_0+2d^2_{-5}+\ 8d^3_{-5}$
$u_6=u_0+\ 6d_0+\ 3d^2_{-5}+\ 13d^3_{-5}-10d^4_{-5}$	$d_0+3d^2_{-5}+13d^3_{-5}-10d^4_{-5}$
$u_7=u_0+\ 7d_0+\ 7d^2_{-5}+\ 29d^3_{-5}-30d^4_{-5}$	$d_0+4d^2_{-4}+16d^3_{-5}-20d^4_{-5}$
$u_8=u_0+\ 8d_0+12d^2_{-5}+\ 51d^3_{-5}-45d^4_{-5}$	$d_0+5d^2_{-5}+22d^3_{-5}-15d^4_{-5}$
$u_9=u_0+\ 9d_0+18d^2_{-5}+\ 82d^3_{-5}-40d^4_{-5}$	$d_0+6d^2_{-5}+31d^3_{-5}+\ 5d^4_{-5}$
$\underline{u_{10}}=u_0+10d_0+25d^2_{-5}+125d^3_{-5}$	$d_0+7d^2_{-5}+43d^3_{-5}+40d^4_{-5}$

Index of the Principal Column	Column of Second Differences	Column of Third Differences
0		
1	$d^2_{-5} - 2d^3_{-5}$	$3d^3_{-5}$
2	$d^2_{-5} + d^3_{-5}$	$3d^3_{-5}$
3	$d^2_{-5} + 4d^3_{-5}$	$3d^3_{-5}$
4	$d^2_{-5} + 7d^3_{-5}$	$-2d^3_{-5} - 10d^4_{-5} = -2d_0{}^3$
5	$d^2_{-5} + 5d^3_{-5} - 10d^4_{-5}$	$-2d^3_{-5}$
6	$d^2_{-5} + 3d^3_{-5} - 10d^4_{-5}$	$3d^3_{-5} + 15d^4_{-5} = 3d_0{}^3$
7	$d^2_{-5} + 6d^3_{-5} + 5d^4_{-5}$	$3d^3_{-5} + 15d^4_{-5} = 3d_0{}^3$
8	$d^2_{-5} + 9d^3_{-5} + 20d^4_{-5}$	$3d^3_{-5} + 15d^4_{-5} = 3d_0{}^3$
9	$d^2_{-5} + 12d^3_{-5} + 35d^4_{-5}$	
10		

If we take Δ, as before, for an interval of five years, and δ for one of one year, we have the following pair of systems:

Original System

$$
\begin{array}{lllll}
\vdots & & & & \\
u_{-5} & & & & \\
 & \Delta u_{-5} & & & \\
u_0 & & \Delta^2 u_{-5} & & \\
 & \Delta u_0 & & \Delta^3 u_{-5} & \\
u_5 & & \Delta^2 u_0 & & \\
 & \Delta u_5 & & \Delta^3 u_0 & \\
u_{10} & & \Delta^2 u_5 & & \\
 & \Delta u_{10} & & & \\
u_{15} & & & & \\
\vdots & & & &
\end{array}
$$

Deduced System

$$
\begin{array}{llll}
u_0 & \delta u_0 & \delta^2 u_0 & \delta^3 u_0 = 3d^3_{-5} \\
 & & & \delta^3 u_1 = 3d^3_{-5} \\
 & & & \delta^3 u_2 = 3d^3_{-5} \\
 & & & \delta^3 u_3 = -2d_0{}^3 \\
 & & & \delta^3 u_4 = -2d^3_{-5} \\
 & & & \delta^3 u_5 = 3d_0{}^3 \\
 & & & \delta^3 u_6 = 3d_0{}^3 \\
 & & & \delta^3 u_7 = 3d_0{}^3 \\
 & & & \delta^3 u_8 = -2d_5{}^3 \\
 & & & \delta^3 u_9 = -2d_0{}^3 \\
 & & & \delta^3 u_{10} = 3d_5{}^3 \\
 & & & \vdots
\end{array}
\Bigg\} (c)
$$

From these systems a remarkably simple rule of calculation is derived for determining the successive $\delta^3 u$, from which again the remaining differences and the values of u itself may be found by continuous addition, as soon as the resulting differences and a few of those of the last column, which do not conform to the general law, have been averaged. For this purpose the the question arises whether the original system goes back further than the new one, or whether both systems commence with the same value u_0. In the former case we have, according to what has already been shown, simply—

$$
\left.
\begin{aligned}
\delta u_0 &= d_0 - 2d^2_{-5} - 2d^3_{-5} \\
\delta^2 u_0 &= d^2_{-5} - 2d^3_{-5}
\end{aligned}
\right\} \quad \ldots\ldots \quad (d)
$$

while $\delta^3 u_0$, $\delta^3 u_1$ . . . remain unchanged; in the latter case, on the other hand, we must decide which law the interpolation has to follow in the first interval, so that an inflection cannot occur at the commencing point. If, with Sprague, we allow that curve to serve for the first space, according to which the derivations of the first normal point of intersection were to be settled, we have clearly, in this case, (where only one derivative is to be considered, the connecting curve of the second degree, and only *one* abnormal interval exists,) to set down :—

$$\Delta_3 u_{-5}=0 \qquad d^3{}_{-5}=0$$
$$\Delta^2 u_{-5}=\Delta^2 u_0 \qquad d^2{}_{-5}=d_0{}^2$$

and the equations under (*d*) are now transformed into

$$\left.\begin{aligned}\delta u_0 &= d_0-2d_0{}^2\\ \delta^2 u_0 &= d_0{}^2\end{aligned}\right\} \quad \ldots\ldots\ldots \quad (d_1)$$

while the beginning of the system (*c*) becomes

$$\left.\begin{array}{llll} u_0 & \delta u_0 & \delta^2 u_0 & \\ & & & \delta^3 u_0=0\\ & & & \delta^3 u_1=0\\ & & & \delta^3 u_2=0\\ & & & \delta^3 u_3=-2d_0{}^3\\ & & & \delta^3 u_4=0\\ & & & \delta^3 u_5=3d_0{}^3 \end{array}\right\} \quad \ldots\ldots \quad (c_1)$$

which from $\delta^3 u_5$ corresponds to the universal law of construction.

For the end of the interpolation the system (*c*) again loses its value if the original column does not go beyond that to be derived from it. In such a case the most suitable plan is to make use of that curve which passes through the three last ordinates, u_n, u_{n-5}, u_{n-10}, and which settled the derivative at the point $n-5$. This follows very simply if we take the d^3 which appears in $(c)=0$.

Sprague's formula (1) and that of Woolhouse (3) can be dealt with in the same manner as formula (2).

For Sprague's formula, if we also assume that the interpolation must be carried out to the extreme limits of the values, and adopt Sprague's assumption for the beginning and the end of the calculation, we obtain—

$$\left.\begin{aligned}
&\delta u_0 = d_0-2d_0{}^2+6d_0{}^3-21d_0{}^4\\
&\delta^2 u_0 = d_0{}^2-4d_0{}^3+16d_0{}^4\\
&\delta^3 u_0 = d_0{}^3-6d_0{}^4\\
&\delta^4 u_0 = d_0{}^4\\
&\hline
&\delta^5 u_0 = \delta^5 u_1 = \ldots = \delta^5 u_5 = 0\\
&\delta^5 u_6 = 0.2d_0{}^5\\
&\delta^5 u_7 = 0\\
&\delta^5 u_8 = -1.2d_0{}^5\\
&\delta^5 u_9 = 0.6d_0{}^5\\
&\hline
&\delta^5 u_{10} = d_0{}^5\\
&\delta^5 u_{11} = 0.6d_0{}^5+0.2d_5{}^5\\
&\delta^5 u_{12} = -1.2d_0{}^5\\
&\delta^5 u_{13} = -1.2d_5{}^5\\
&\delta^5 u_{14} = 0.6d_5{}^5+0.2d_0{}^5\\
&\hline
&\delta^5 u_{15} = d_5{}^5\\
&\quad\vdots
\end{aligned}\right\} \quad \ldots \quad (e)$$

Here the last two d^5 must be assumed as $=0$. For Woolhouse's formula, if it is preferred for the sake of simplicity, it is required that the original system must overlap that to be derived from it in both directions.

$$\left.\begin{array}{l}\delta u_0 = d_0 - 2d^2_{-5} \\ \hline \delta^2 u_0 = d^2_{-5} \\ \delta^2 u_1 = 4d^2_{-5} - 3d_0^2 \\ \delta^2 u_2 = 4d_0^2 - 3d^2_{-5} \\ \delta^2 u_3 = d_0^2 \\ \delta^2 u_4 = d_0^2 \\ \hline \delta^2 u_5 = d_0^2 \\ \delta^2 u_6 = 4d_0^2 - 3d_5^2 \\ \quad\vdots\end{array}\right\} \quad \ldots\ldots \quad (f)$$

From this the law of construction of the successive differences δ^2 may easily be perceived. The last system, it may be said incidentally, permits a somewhat simpler calculation, if we make $\delta^2 u_1 = d^2_{-5} - 3\delta^3_{-5}$, $d^2 u_0 = d_0^2 + 3\delta^3_{-5}$ . . . &c., where $\delta^3 = 5d^3 = \frac{\Delta^3}{5^2}$.

If we compare the examples of calculations which Sprague has given with those which result from (*e*) we shall at once recognize the advantages of the new method of calculating differences. Moreover, in this place it was only necessary to settle the theoretical form of the last column of differences δ^n for the different formulæ of interpolation, and I now take leave of this subject, which is by no means exhausted, and still presents many interesting points of view, as I reserve myself the privilege of returning to it at another opportunity.

3. The Derivation of the Formula of Graduation.

In the system of differences of the sth order

$$\begin{array}{llll} u_0 & \delta u_0 & & \\ u_1 & \delta u_1 & \delta^2 u_0 & \cdot \\ u_2 & & & \delta^s u_0 \\ \vdots & & & \vdots \\ & & \delta^2 u_{n-2} & \cdot\cdot\ \delta^s u_{n-s} \\ & \delta u_{n-1} & & \\ u_n & & & \end{array}$$

we obtain the differences $\delta^{s-1}u_1$, $\delta^{s-1}u_2$ . . . $\delta^s{}_{-1}u$ by adding to $\delta^{s-1}u_0$ first $\delta^s u_0$, to that again $\delta^s u_1$, and so on, till all differences of the sth order have been utilized. In the same manner we can derive the column of differences $s-2$ from the column $s-1$, and the principal column from the column of differences δu_0, δu_1 . . . δu_{n-1}. If we suppose this calculation continued past the principal column by adding first u_0, then u_1, and so on to a commencing value arbitrarily selected, we obtain a new column, which may conveniently be distinguished as Σu_0, Σu_1, Σu_{n+1}, where Σu_0 is considered as the commencing value, and stands clearly in the same relation to u as u to δu, so that δ and Σ signify opposite operations. If we again construct a new column from Σu_0, Σu_1 . . . Σu_{n-1} by commencing with an arbitrary value $\Sigma^2 u_0$, adding to this Σu_1, Σu_2 . . . &c., and repeating this process $r-2$ times, we finally obtain, by the logical carrying out of this method of demonstration the following system—

$$\left.\begin{array}{llllllll}
\Sigma^r u_0 & & & & & & & \\
\Sigma^r u_1 & \Sigma^{r-1} u_0 & \cdot & & & & & \\
\Sigma^r u_2 & \Sigma^{r-1} u_1 & \cdot & \Sigma^2 u_0 & \Sigma u_0 & u_0\,\delta u_0 & \cdot & \\
 & \Sigma^{r-1} u_2 & \cdot & \Sigma^2 u_0 & \Sigma u_1 & u_1\,\delta u_1 & \cdot & \delta^s u_0 \\
 & & \cdot & \Sigma^2 u_2 & \Sigma u_2 & u_2\,\delta u_2 & \cdot & \delta^s u_1 \\
 & & & & & & \cdot & \delta u_2 \\
 & : & : & : & : & : & : & \delta^s u_{n-s} \\
 & & & & & u_n & \delta u_{n-1} & \\
 & & & \Sigma^2 u_{n+2} & \Sigma u_{n+1} & & & \\
\Sigma^r u_{n+r} & \Sigma^{r-1} u_{n+r-1} & \cdot & & & & &
\end{array}\right\} \quad . \quad (g)$$

This system is constructed according to one and the same rule, and can be described at will, either as a system of differences or summation of the $s+r$th order. It may be remarked incidentally that if the commencing values Σu_0, $\Sigma^2 u_0 \ldots \Sigma^r u_0$, which we can look upon as interpolation constants, are taken as $=o$, then—

$$\Sigma u_{n+1} = u_0 + u_1 + u_2 + \ldots + u_n$$

$$\Sigma^2 u_{n+2} = (n+1)u_0 + n\,u_1 + (n-1)u_2 + \ldots + u_n$$

$$\Sigma^3 u_{n+3} = \frac{(n+2)(n+1)}{1.2} u_0 + \frac{(n+1)n}{1.2} u_1 + \frac{n(n-1)}{1.2} \cdot u_2 + \ldots + u_n$$

$$\Sigma^r u_{n+1} = \frac{(n+r-1)(n+r-2)\ldots(n+1)}{1.2\ldots(r-1)} \cdot u_0 + \frac{(n+r-2)(n+r-3)\ldots n}{1.2\ldots(r-1)} \cdot u_1 + \frac{(n+r-3)(n+r-4)\ldots(n-1)}{1\ .\ 2\ldots(r-1)} \cdot u_2 + \ldots + u_n$$

so that we can express the several $\Sigma's$ by means of the terms of the original main column u_0, u, . . . &c., according to a simple law.

From the method of construction of this system (g) it follows, without further demonstration, that

$$\delta\Sigma u_x = u_x$$
$$\delta^q \Sigma u_x = \delta^{q-1} u_x$$
$$\delta^q \Sigma^q u_x = u_x$$

which in the sequel will be found valuable.

We now introduce a new system of summation by assuming

$$\left.\begin{array}{llll}
u_0 + u_1 & + \ldots + u_{k-1} & = S_0 \\
u_1 + u_2 & + \ldots + u & = S_1 \\
 & \vdots & \\
u + u_{x-1} & + \ldots + u_{x+k-1} & = S_x \\
 & & \\
S_0 + S_1 & + \ldots + S_{k-1} & = S_0^2 \\
S_1 + S_2 & + \ldots + S_k & = S_1^2 \\
 & \vdots & \\
S_x + S_{x+1} & + \ldots + S_{x+k-1} & = S_x^2
\end{array}\right\} \quad . \quad . \quad . \quad (h)$$

and so on.

We have then, if Δ refers to the interval k,

$$\begin{aligned} S_0 &= \Sigma u_k \quad - \Sigma u_0 = \Delta \Sigma u_0 \\ S_1 &= \Sigma u_{k+1} - \Sigma u_1 = \Delta \Sigma u_1 \\ &\vdots \\ S_x &= \Delta \Sigma u \end{aligned}$$

and further,

$$\begin{aligned} S_0^2 &= \Delta\Sigma u_0 + \Delta\Sigma u_1 + \ldots + \Delta\Sigma u_{k-1} = \Delta(\Sigma u_0 + \Sigma u_1 + \ldots + \Sigma u_{k-1}) \\ &= \Delta(\Sigma^2 u_k - \Sigma^2 u_0) = \Delta^2 \Sigma^2 u_0 \\ S_1^2 &= \Delta^2 \Sigma^2 u_1 \\ &\vdots \\ S_x^2 &= \Delta^2 \Sigma^2 u_x \end{aligned}$$

and finally, generally,

$$S_x^q = \Delta^q \Sigma^q{}_x,$$

or, as can be easily seen, in those cases where the operations of differentiation and summation can both be carried out in inverted order of columns.

$$S_x^q = \Sigma^q \Delta^q u_x \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (i)$$

Here, to emphasise it once more, Δ has reference to the interval k, while δ, which is placed opposite, refers to the interval 1.

Summations such as those to be found hereunder (k) are already familiar to us from the investigations of Higham and Ackland, and will also have a part to play in this paper. We therefore introduce them here for the purpose of a second, and in some respects more convenient, method of demonstration by making

$$\left.\begin{aligned} u_{x-\xi} + u_{x-\xi+1} + \ldots + u_x + u_{x+1} + \ldots + u_{x+\xi} &= \sigma \\ \sigma_{x+\xi} + \sigma_{x-\xi+1} + \ldots + \sigma_x + \sigma_{x+1} + \ldots + \sigma_{x+\xi} &= \sigma^2 \\ &\vdots \end{aligned}\right\} \quad (k)$$

and understand by σ_ϕ, $\sigma_\phi{}^2$ . . . &c., those summations which are arrived at in the same manner as σ, σ^2 . . . &c., but in which each index is higher than the last by ϕ, so that the index of the middle term is $x+\phi$. If we take $\xi = \frac{k-1}{2}$, then the following relations arise between the new and the earlier summations:

$$\left.\begin{aligned} \sigma &= S_{x-\frac{k-1}{2}} \\ \sigma^2 &= S^2_{x-(k-1)} \\ &\vdots \\ \sigma^q &= S^q_{x-q\ \frac{k-1}{2}} \end{aligned}\right\} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (l)$$

and of these we shall make use in the sequel.

And now to return to our problem of graduation. Instead of making use of Woolhouse's principle direct, and taking the mean of five tables which have been arrived at by interpolation, we can clearly take the mean of the differences of the first, second, or any other order, and construct the final table by means of continuous summation

of the new differences thus obtained. The result must be identical in both cases. From this connection a simple process follows, by which we can at once derive from each proposed formula of interpolation the corresponding formula of graduation according to Woolhouse's principle, and at the same time the latter assumes a form which is eminently adapted to practical calculation. This process shall be explained immediately according to Woolhouse's formula of interpolation.

Let $\ldots u_{-2},\ u_{-1},\ u_0,\ u_1,\ u_2 \ldots$ be the values to be graduated, of which $u_{-5},\ u_0,\ u_5 \ldots u_{-4},\ u_1,\ u_6 \ldots$ &c., are applied as the first, second, and succeeding interpolations respectively. Then we have the following as third differences of the several curves (f):

First Curve	Second Curve	Third Curve
$\vdots$	$\vdots$	$\vdots$
$\delta^2 u_0 = d^2{}_{-5}$		
$\delta^2 u_1 = 4d^2{}_{-5} - 3d_0{}^2$	$\delta^2 u_1 = d^2{}_{-4}$	
$\delta^2 u_2 = 4d_0{}^2 - 3d^2{}_{-5}$	$\delta^2 u_2 = 4d^2{}_{-4} - 3d_1{}^2$	$\delta^2 u_2 = d^2{}_{-3}$
$\delta^2 u_3 = d_0{}^2$	$\delta^2 u_3 = 4d_1{}^2 - 3d^2{}_{-4}$	$\delta^2 u_3 = 4d^2{}_{-3} - 3d_2{}^2$
$\delta^2 u_4 = d_0{}^2$	$\delta^2 u_4 = d_1{}^2$	$\delta^2 u_4 = 4d_2{}^2 - 3d^2{}_{-3}$
$\delta^2 u_5 = d_0{}^2$	$\delta^2 u_5 = d_1{}^2$	$\delta^2 u_5 = d_2{}^2$
$\delta^2 u_6 = 4d_0{}^2 - 3d^2{}_{-5}$	$\delta^2 u_6 = d_1{}^2$	$\delta^2 u_6 = d_2{}^2$
$\vdots$	$\vdots$	$\vdots$

Fourth Curve	Fifth Curve
$\vdots$	$\vdots$
$\delta^2 u_3 = d^2{}_{-2}$	
$\delta^2 u_4 = 4d^2{}_{-2} - 3d_3{}^2$	$\delta^2 u_4 = d^2{}_{-1}$
$\delta^2 u_5 = 4d_3{}^2 - 3d^2{}_{-2}$	$\delta^2 u_5 = 4d^2{}_{-1} - 3d_4{}^2$
$\delta^2 u_6 = d_3{}^2$	$\delta^2 u_6 = 4d_4{}^2 - 3d^2{}_{-1}$
$\vdots$	$\vdots$

And in order that the $\delta^2 u_3$ of the final graduated table may be distinguished from the $\delta^2(u)_3$,

$$\delta^2(u)_3 = \frac{1}{5} \cdot [d_0{}^2 + d_1{}^2 + (4d_2{}^2 - 3d^2{}_{-3}) + (4d^2{}_{-2} - 3d_3{}^2) + d^2{}_{-1}]$$

$$= \frac{1}{5} \cdot (-3d^2{}_{-3} + 4d^2{}_{-2} + d^2{}_{-1} + d_0{}^2 + d_1{}^2 + 4d_2{}^2 - 3d_3{}^2)$$

For each different δ^2 of the graduated table, however, the same law of construction must hold good, as can easily be shown from the foregoing plan, and therefore by increasing all indices by $x-3$, and at the same time taking notice that d^2 is used for $\frac{\Delta^2 u}{5^2}$, we have this general expression:

$$\delta^2(u)_x = \frac{1}{5^3} \cdot (-3\Delta^2 u_{x-7} + 4\Delta^2 u_{x-6} + \Delta^2 u_{x-5} + \Delta^2 u_{x-4} + \Delta^2 u_{x-3} + 4\Delta^2{}_{x-2} - 3\Delta^2{}_{x-1})$$

Now to deduce u_x from $\delta^2(u)_x$, it is only necessary to employ a double summation, or, what is the same thing, integration according to the interval 1 from x, which is accomplished according to (q) by

prefixing Σ^2 to every term, and adding to one side or the other of the equation two constants of integration, one of which must be combined with x. Leaving this correction aside for the present, we have

$$(u)_x = \Sigma^2\delta^2(u)_x = \frac{1}{5^3}\cdot(-3\Sigma^2\Delta^2 u_{x-7} + 4\Sigma^2\Delta^2 u_{x-6} + \ldots - 3\Sigma^2\Delta^2{}_{x-1})$$

or, taking into consideration equation (*i*),

$$(u)_x = \frac{1}{5^3}\cdot(3S^2{}_{x-7} + 4S^2{}_{x-6} + S^2{}_{x-5} + S^2{}_{x-4} + S^2{}_{x-3} + 4S^2{}_{x-2} - 3S^2{}_{x-1})$$

The quantities S^2—as generally also S^q—group themselves symmetrically out of the (ungraduated) values u, always include for every assigned value of x an equal final number of u's, and must necessarily disappear when the corresponding u's become o. But the same properties belong also clearly to the graduated u, the quantities (u), and therefore in the foregoing equation we can in reality fail to discover neither a simple constant nor one united with x. Let us also notice that the terms in brackets ( ) may be reproduced by means of the formula:

$$\begin{aligned} &-3(S^2{}_{x-7} + S^2{}_{x-6} + S^2{}_{x-5} + S^2{}_{x-4} + S^2{}_{x-3}) \\ &\quad +7\,.(S^2{}_{x-6} + S^2{}_{x-5} + S^2{}_{x-4} + S^2{}_{x-3} + S^2{}_{x-2}) \\ &\qquad -3(S^2{}_{x-5} + S^2{}_{x-4} + S^2{}_{x-3} + S^2{}_{x-2} + S^2{}_{x-1}) \end{aligned}$$

or, having regard to (*k*), and because in this case $k=5$, by means of

$$-3S^3{}_{x-7} + 7S^3{}_{x-6} - 3S^3{}_{x-5}$$

and that, on the other hand, for $k=5$, or $\frac{k-1}{2}=2$, as a result of (*l*),

$$\sigma^3 = S^3{}_{x-3.2} = S^3{}_{x-6},$$
$$S^3{}_{x-7} = \sigma^3{}_{-1},\quad S^3{}_{x-5} = \sigma_1{}^3,$$

and so we arrive finally at the formula

$$(u) = \frac{10\sigma^3 - 3(\sigma^3{}_{-1} + \sigma^3 + \sigma_1{}^3)}{125} \quad . \quad . \quad . \quad . \quad . \quad (4)$$

By these means Woolhouse's graduation is reduced to a well known simple rule of calculation, discovered by Higham (*J.I.A.*, vol. xxxi, pp. 319 and following).

If we apply this process to the new formula of interpolation (2), and the system (*c*) respectively, there results:

$$(u) = \frac{0{\cdot}6(\sigma_{-1}{}^3 + \sigma^3 + \sigma_1{}^3) - 0{\cdot}4(\sigma^3{}_{-3} + \sigma_3{}^3)}{5^3}$$

or
$$(u) = 0{\cdot}0016\,.\,[3(\sigma^3{}_{-1} + \sigma^3 + \sigma_1{}^3) - 2(\sigma^3{}_{-3} + \sigma_3{}^3)] \quad . \quad (5)$$

while the system (*c*), which relates to Sprague's osculatory interpolation, leads to the following formula:

$$(u) = \frac{\sigma^5 + 0{\cdot}6(\sigma^5{}_{-1} + \sigma_1{}^5) - 1{\cdot}2(\sigma^5{}_{-2} + \sigma_2{}^5) + 0{\cdot}2(\sigma^5{}_{-4} + \sigma_4{}^5)}{5^4} \quad (6)$$

Formula (5) is the one which, in my opinion, is especially suitable for mechanical graduations in which regularity in the results is of importance. How far it fulfils this condition the following sections show.

It is interesting to note that the formula which Higham recommends as in the front rank for mechanical graduations, and which rests upon quite a different theoretical basis, may be expressed by means of the quantities σ, which in this case relate to a summary of every five values. (Compare *inter alia* the essay in *J.I.A.*, vol. xxxi, already referred to.) If we understand with Higham by the symbols $Sp.q.r.$ a sum which arises if we add together a column of terms following each other, first p at a time, then the newly-constructed column q at a time, and again the last r at a time, and so on, then the formula in question runs as follows:

$$(u) = \frac{3\,S_{5.5.5.4.2} - 3\,S_{5.5.5.5}}{125}$$

But

$$S_{5.5.5.5} = \sigma^3 + \sigma_1{}^3 + \sigma_{-1}{}^3 + \sigma_2{}^3 + \sigma_{-2}{}^3$$

$$S_{5.5.5.4.2} = 2\sigma^3 + 2\sigma_1{}^3 + 2\sigma_{-1}{}^3 + \sigma_2{}^3 + \sigma_{-2}{}^3$$

and hence we also have

$$(u) = 0{\cdot}08.\,[(\sigma_{-1}{}^3 + \sigma^3 + \sigma_1{}^3) - (\sigma_{-2}{}^3 + \sigma_2{}^3)] \quad . \quad . \quad (7)$$

I shall make use of this formula in what follows, and shall describe it briefly as Higham's.

4. The Results of the Formulæ for Graduation.

It is self-evident that the larger the number of observed facts, the greater regularity will appear in the results of a formula of graduation. But the number of the terms does not of itself give this result; much also depends upon the manner in which the observations are dealt with. Other circumstances being equal, that formula will work most smoothly in which the co-efficients which belong to the original observations form a curve which is very little distorted, and in ascending and descending forms nearly an even line, which runs as evenly and smoothly as possible through those points where variations are unavoidable, while, as the calculation proceeds, each single observed fact receives in succession all the co-efficients as factor, and an irregularity would be so much the less likely to disturb it, the more gradually it fell in value, and the more evenly it was distributed over a considerable space. To have first recognized and estimated this connection is the special merit of Higham, whose graduation formula yields far more even results than those of Woolhouse, although they are inferior from a theoretical point of view.

There is no difficulty in tracing back the deduced graduation formulæ (5) and (6) to the quantities to be graduated themselves. The sum σ (when $k=5$, which in this case solely enters into the question) is compounded of u_{-2}, u_{-1}, u_0, u_1, u_2, and yields the coefficients:

1 1 1 1 1,

while the coefficients

1 2 3 4 5 4 3 2 1

arise from σ^2, and

1 3 6 10 15 18 19 18 15 10 6 3 1

from σ^3. If we note that σ_ϕ has the same coefficients, but for an index increased by ϕ, we arrive at the following equations by performing the multiplication indicated in (5) and (6) by 0·0016, and the division by 5^4 respectively.

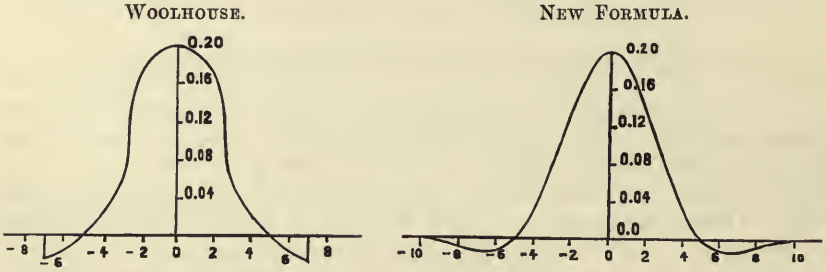
$$(u) = 0{\cdot}2000u_0 + 0{\cdot}1824u_1 + 0{\cdot}1392u_2 + 0{\cdot}0848u_3 + 0{\cdot}0336u_4 - 0{\cdot}0128u_6 - 0{\cdot}0144u_7 - 0{\cdot}0096u_8 - 0{\cdot}0032u_9 + \ldots \quad (5a)$$

and

$$(u) = 0{\cdot}20000u_0 + 0{\cdot}18688u_1 + 0{\cdot}14528u_2 + 0{\cdot}08768u_3 + 0{\cdot}03488u_4 - 0{\cdot}01952u_6 - 0{\cdot}02272u_7 - 0{\cdot}01472u_8 - 0{\cdot}00512u_9 + 0{\cdot}00256u_{11} + 0{\cdot}00288u_{12} + 0{\cdot}00160u_{13} + 0{\cdot}00032u_{14} + \ldots \quad (6a)$$

The first of these applies to the graduation formula (5) and the second to (6). The terms omitted have negative indices throughout, and correspond exactly to those with a positive index.

If we exhibit graphically the coefficients of (5*a*) as well as Woolhouse's, we shall at once recognize, that the new formulæ are to be preferred.



Woolhouse's curve enters with a jump at index 7, and bulges out, or, as Higham expresses himself, is "high-shouldered," by which means the observed facts receive a rapidly changing value from one graduated value to the other. On the other hand, the new curve rises and falls in its most important part with almost absolute evenness, and at the beginning and end of the abscissæ inclines at a moderate tangent.

The law underlying the coefficients stands out in the clearest manner if we take into consideration differences of the first and higher orders, and I therefore subjoin a pertinent comparison, in which Higham's formula is also taken into consideration.

Table I.

Coefficients of Various Graduation Formulæ and their Differences.

(*See* pp. 48, 49).

It will be seen from this Table that Higham's formula is decidedly better than Woolhouse's, but that formulæ (5) and (6) are an improvement upon either. As it is advantageous when the differences of higher order also run as smoothly as possible, formula (5) graduates still more evenly than (6), which is somewhat surprising in view of the greater number of terms in the latter.

In order to exhibit a practical example of the utility of the new formula (5), I have graduated the $H^{M\,(5)}$ Table both by this method and by Higham's formula. The results, which may be described as exceedingly satisfactory, are shown in the following Table III. (pp. 20, 21), which also repeats Woolhouse's figures. It must be noted that the last-named figures are taken from the "Institute of Actuaries' Life Tables (London 1872)," in which certain accidental irregularities appear to have been removed already in an artificial manner, and that the percentages of deaths, and not the numbers living, have been taken as the foundation of the new graduations. The calculation itself is explained by the fragment of the graduation prefixed in Table II. (p. 50).

Formula (6) is unsuitable for purposes of graduation, as it is constructed in a far too complicated manner. It also takes into consideration widely distant terms, which many may regard as an evil, although the coefficients of the distant terms are very small. If we only take into account the coefficients with their absolute values, the sum of these amounts to :

Index	Woolhouse's, Higham's, and the new formula (5) combined.		Formula (6).	
0	0·2000	93·1	0·2000	88·9
− 1 to − 4 and 1 to 4	0·8800		0·9094,4	
− 5 to − 9 and 5 to 9	0·0800	6·9	0·1241,6	9·9
−10 to −14 and 10 to 14			0·0147·2	1·2
	1·1600	100·0	1·2483·2	100·0

and according to all the formulæ it is almost exclusively the nine central observations that are of importance.

5. The Theoretical Error.

It has already often been discussed, which function is most suitable for graduation, the numbers of the living in the Mortality Table, or the probabilities of death. Woolhouse decided in favour of the numbers living, because they were apparently more easily treated, and in his method it was advantageous to allow the conclusion of the (ungraduated) table to run out to nothing. On the other hand, Sprague and all those who graduate by the graphic method, make use of the probabilities of death, or, what comes to the same thing, the percentage of cases of death, by which a judgment as to the importance of individual observations can be most quickly formed.

In my opinion, the decision, as far as mechanical graduations are concerned, depends principally upon the question as to which function causes us to expect the smallest theoretical error. It is manifest that

we cannot express either the numbers living or the probabilities of death for long periods by means of parabolic curves. Nevertheless, every mechanical graduation lays out such a curve, and thereby recedes theoretically from the true curve. A second point of view would be as to whether, by the use of one or the other function, a greater regularity could not be obtained. And in this connection there is much to be said for the use of the numbers living, since every interpolation in them brings with it a certain graduation of the probabilities of death which are to be found in the interval. But the advantage disappears entirely, if all points are proportionately treated, and corresponding lines are drawn through them, as can be recognised from the fact that Woolhouse's formula yields nearly the same results whether it is applied to the probabilities of death or to the numbers living, and therefore this point of view may be laid aside.

In order to solve the main question, it will be found useful to experiment with one or the other graduation formula on a table which already satisfies an analytical law and manifests a normal character throughout its whole course. I have made a few comparative investigations on this point, in fact on the H^M Table of the *Text-Book* (Part II., p. 88) which is graduated by means of the Gompertz-Makeham formula, which Sprague has already made use of for a similar purpose. The comparison was somewhat prejudiced by the fact that the new graduation of the numbers living was arrived at by means of Woolhouse's formula, while, for that of the probabilities of death and their logarithms formula (5) was made use of, and we must therefore keep in view that, as shall be shown hereafter, the theoretical error, according to Woolhouse's formula, is somewhat less than that with the other.

As we can see, the graduation of the numbers living in most of the groups of ages leads to greater errors than does that of the probabilities of death, as well in the latter themselves as in the numbers of deaths according to the calculations. Only the total number of deaths comes out somewhat more exact by the former method, a matter which is of little importance, as an alteration in the numbers living and at risk could entirely alter the result, and the correspondence in the whole would be best decided according to the sum of the actual values of the variations. This sum, however, amounts in the case of the numbers living to 9·73, and in that of the probabilities of death to 5·57, and it can therefore be finally decided that the latter yield in practice the better foundation for mechanical graduation.

(*See* Table IV., p. 54.)

The graduation carried out on the basis of the logarithms shows an excellent result. The differences in all the groups of ages are of the smallest, and the total variation in the numbers of deaths according to the calculation shows, whether the sign of each single variation is considered or not, only −0·55 or 0·61. The result in general is not weakened, because the probabilities of death at the younger ages lie near zero, the logarithm for 0 itself (negative)

becomes infinite, and the disturbances present in the probabilities of death at these ages are greatly exaggerated in the logarithms. But when a first graduation lies before us, which has removed the greater disturbances, a second graduation of the logarithms can be well undertaken, and is then to be preferred to any other mechanical one, because a new theoretical error is almost entirely avoided.

We shall best come to a decision as to the relative magnitude of theoretical errors of different formulæ of graduation, which are applied to one and the same case, if we consider the ungraduated observed values which enter into the formula as conforming to a law, and expand them according to derivatives of the middle term or the corresponding central differences. The complete execution of this process is certainly very laborious, although it is interesting to learn not only the first, but also the second term of the correction arising from this process, and I have therefore struck out another path which follows on the former investigations of Higham.

Again, let $Sp.q.r.\ldots$ be a sum which has arisen from successive consecutive groups of p, q, r, terms, and so on. Then we have in symbols:

$$Sp.q.r\ldots = u_0 \cdot \frac{1-(1+\delta)^p}{\delta} \cdot \frac{1-(1+\delta)^q}{\delta} \cdot \frac{1-(1+\delta)^r}{\delta} \ldots$$

or, if we put $(1+\delta) = e^{\frac{d}{dx}}$,

$$Sp.q.r\ldots = u_0 \cdot \frac{e^{\frac{p}{2}\cdot\frac{d}{dx}} - e^{-\frac{p}{2}\cdot\frac{d}{dx}}}{e^{\frac{1}{2}\cdot\frac{d}{dx}} - e^{-\frac{1}{2}\cdot\frac{d}{dx}}} \cdot \frac{e^{\frac{q}{2}\cdot\frac{d}{dx}} - e^{-\frac{q}{2}\cdot\frac{d}{dx}}}{e^{\frac{1}{2}\cdot\frac{d}{dx}} - e^{-\frac{1}{2}\cdot\frac{d}{dx}}} \ldots$$

Now, if we expand according to powers of $\frac{d}{dx}$ and make

$$\begin{aligned} p+q+r+\ldots &= n \\ p^2+q^2+r^2+\ldots - n &= B_2 \\ p^4+q^4+r^4+\ldots - n &= B_4 \\ &\vdots \end{aligned}$$

and

$$\frac{5B_2^2-2B_4}{3.2^4} = k_4$$

$$\frac{35B_2^3-42B_2B_4+16B_6}{9.2^6} = k_6$$

$$\vdots$$

we obtain

$$\frac{Sp.q.r\ldots}{p.q.r\ldots} = u_0\left(1+\frac{B_2}{24}\cdot\frac{d^2}{dx^2}+\frac{k_4}{2.3.4.5}\cdot\frac{d^4}{dx^4}+\frac{k_6}{2.3.4.5.6.7}\cdot\frac{d^6}{dx^6}+\ldots\right) \quad (m)$$

whereby a generalization of one of the theorems discovered by Higham is arrived at. (*J.I.A.*, vol. xxv., pp. 245 and following.)

Considering that

$$\sigma^n = S_{5.5..}\ \text{(n times)}$$

$$\sigma^n{}_\xi = \sigma \,.\, (1+\delta)^\xi$$

$$= \sigma_{5.5..}\ \text{(n times)} \,.\, e^{\xi \cdot \frac{d}{dx}}$$

there results further for each ξ, zero included,

$$\frac{\sigma^n{}_{-\xi} + \sigma^n{}_\xi}{2} = u_0 \cdot \left(1 + \frac{2n+\xi^2}{2} \cdot \frac{d^2}{dx^2} + \frac{2\beta_4 + 60n\xi^2 + 5\xi^4}{120} \cdot \frac{d^4}{dx^4} + \frac{2\beta_6 + 6\beta_4 \cdot \xi^2 + 30n\xi^4 + \xi^6}{720} \cdot \frac{d^6}{dx^6} + \ldots\right) \quad (n)$$

in which

$$\left.\begin{aligned} \beta_4 &= 30n^2 - 13n \\ \beta_6 &= 60n^3 - 78n^2 + 31n \\ &\vdots \end{aligned}\right| \quad \ldots\ldots (o)$$

The graduation formulæ hitherto under discussion may all be reduced to this form:

$$(u) = \frac{a_0 \,.\, \sigma^n + a_1 \cdot \frac{\sigma_{-1}{}^n + \sigma_1{}^n}{2} + a_2 \cdot \frac{\sigma^n{}_{-2} + \sigma_2{}^n}{2} + \ldots}{5^n} \quad . \quad (p)$$

Now if we apply (n) to (p), and for abbreviation make

$$\left.\begin{aligned} a_0 + a_1 + a_2 + \ldots &= A_0 \\ 1^2 a_1 + 2^2 a_2 + \ldots &= A_2 \\ 1^4 a_1 + 2^4 a_2 + \ldots &= A_4 \\ &\vdots \end{aligned}\right| \quad \ldots\ldots (q)$$

we obtain

$$(u) = u_0 \cdot \left(A_0 + \frac{2nA_0 + A_2}{2} \cdot \frac{d^2}{dx^2} + \frac{2\beta_4 \,.\, A_0 + 60nA_2 + 5A_4}{120} \cdot \frac{d^4}{dx^4} + \frac{2\beta_0 \,.\, A_0 + 6\beta_4 A_2 + 30nA_4 + A_6}{720} \cdot \frac{d^6}{dx^6} + \ldots\right)$$

and this equation easily solves the question here brought forward.

In our graduation formulæ we have either $n=3$ or $n=5$. Besides they are so constructed that $A_0=1$ and the coefficient of $\frac{d^2}{dx^2}$ must disappear, therefore $A_2 = -2n$. Hence we have either

$$(u) = u_0 + \frac{A_4 - 123{\cdot}6}{24} \cdot u^{IV} + \frac{90A_4 + A_6 - 6294}{720} \cdot u^{VI} + \ldots$$

or

$$(u) = u_0 + \frac{A_4 - 326}{24} \cdot u^{IV} + \frac{150A_4 + A_6 - 29690}{720} \cdot u^{VI} + \ldots$$

according to whether $n=3$ or $n=5$. In Woolhouse's graduation, according to formula (4), $n=3$, $a_0=7$, $a_1=-6$, $a_2=a_3=\ldots=0$. In formula (5), on the other hand, we have $n=3$, $a_0=0{\cdot}6$, $a_1=1{\cdot}2$, $a_2=0$, $a_3=-0{\cdot}8$, while for formula (7) $n=3$, $a_0=1$, $a_1=2$, $a_2=-2$; and for formula (6) $n=5$, $a_0=5$, $a_1=6$, $a_2=-12$, $a_3=0$, $a_4=2$. We therefore finally obtain the following relations between the graduated (u) and the true u. In Woolhouse's graduation,

$$(u)=u-5{\cdot}4\,u^{\mathrm{IV}}-9{\cdot}5\,u^{\mathrm{VI}}+\ldots$$

For the graduation according to formula (5),

$$(u)=u-7{\cdot}8\,u^{\mathrm{IV}}-17{\cdot}5\,u^{\mathrm{VI}}+\ldots$$

For Higham's graduation,

$$(u)=u-6{\cdot}4\,u^{\mathrm{IV}}-12{\cdot}67\,u^{\mathrm{VI}}+\ldots$$

and for that according to formula (6),

$$(u)=u+37\,u^{\mathrm{VI}}+\ldots$$

The relationship between u^{IV} and u^{VI} can be estimated if we understand by u the probability of dying, and assume that this satisfies the form $a+b\,.\,c^x$, which corresponds very nearly with the Gompertz-Makeham hypothesis.

Distinguishing the Napierian logarithm as λ, we then have $u_1=b.c^x\lambda c$, $u^{\mathrm{IV}}=b.c^x.(\lambda c)^4$, $u^{\mathrm{VI}}=b.c^x(\lambda c)^6$, $\frac{u^{\mathrm{VI}}}{u^{\mathrm{IV}}}=(\lambda c)^2$, and as the common logarithm of c is usually about 0·04, and the Napierian about 0·1, $\frac{u^{\mathrm{VI}}}{u^{\mathrm{IV}}}=0{\cdot}01$. In those formulæ which contain both u^{IV} and u^{VI}, therefore, the third term practically disappears altogether as against the second, and the final conclusion is that formula (6) yields the most accurate results, and this formula, as well as those of Woolhouse and Higham, excel formula (5) in correctness. But, judging by the foregoing investigation, the error can, in all cases, be only small, especially if we undertake the graduation by means of the logarithms of the probabilities of death.

The formula (m) as well as (n) is valuable in order to deduce experimentally formulæ of graduation according to Higham's method, and we can give these experiments a still more scientific basis by starting from (p), and settling the coefficients a_0, a_1 . . . &c., so that on one side the factor of $\frac{d^2}{dx^2}$, and eventually also that of $\frac{d^4}{dx^4}$ disappears, and on the other side the sum of the squares of the third or higher differences of the coefficients belonging to u_0, u_1. . . &c., becomes a minimum. In this way I have, as a matter of fact, obtained several formulæ which yielded decidedly practical advantages in calculation. But they were either more complicated than formula (5), or were less suitable for graduation, or had greater theoretical errors; and I have, therefore, arrived at the conviction that it will hardly be possible to draw up a more suitable formula than this one.

6. The Improvement of the First Graduation with the Assistance of the Estimated Numbers of Deaths.

When we have completed a graduation it is usual to prove its correspondence with the observation by comparing the estimated and actual numbers of deaths. If the deviations of opposite signs in the whole table and for shorter groups of ages are tolerably equal, we may consider the correspondence a good one. If the contrary be the case, we are warranted in either discarding or amending the graduation. Under these circumstances it concerns us to detect those variations by the aid of a mechanical graduation to the end of the table, as has already been effected by Sprague and others by the graphic method. And at this point, to avoid arbitrary methods, and to achieve a consistent process, we will divide the table into equal and consecutive intervals of, say, five years. Let $L_0, L_1 \ldots L_5$ be the numbers living and at risk belonging to a given interval, $T_0, T_1 \ldots T_5$ be the actual deaths according to observations, $q_0, q_1 \ldots q_5$ the probabilities of death according to the graduation, and $f_0, f_1 \ldots f_5$, the improved values of the latter to be arrived at, we can then place

$$\left.\begin{array}{l} f_0 = q_0 + \delta \\ f_1 = q_1 + \delta \\ \quad\vdots \\ f_5 = q_5 + \delta \end{array}\right| \quad \ldots\ldots\ldots \quad (r)$$

in which

$$\delta = \frac{T_0 + T_1 + \ldots + T_5 - L_0 q_0 - L_1 q_1 - \ldots - L_5 q_5}{L_0 + L_1 + \ldots + L_5},$$

for the quantity δ is just that by which the curve which we have obtained in the section is incorrect, and lies too deep. It is of importance that this operation shall by no means produce a new theoretical error but shall even remove that which is present in q. To make this clear, we will assume for a moment that the material of the observations is infinite, and further that no errors in the observations have been discovered, which would certainly render a graduation superfluous. Then $\frac{T_0}{L_0}, \frac{T_1}{L_1}, \ldots \frac{T_5}{L_5}$ are identical with the true probabilities of death, $\phi_0, \phi_1 \ldots \phi_5$, while $q_0, q_1 \ldots q_5$ deviate from them only in so far as they are affected by theoretical errors. If the latter are respectively $c.q_0^{IV} + \ldots, c.q_1^{IV} + \ldots, \ldots cq_5^{IV} + \ldots$, in which q^{IV} stands for the fourth derivative, we have then $\phi_0 = q_0 + cq_0^{IV} + \ldots$ &c., and

$$\delta = \frac{\begin{array}{l} L_0\phi_0 + L_1\phi_1 + \ldots + L_5\phi_5 - L_0(\phi_0 - c.q_0^{IV} - \ldots) \\ \qquad - L_1(\phi_1 - c.q_1^{IV} - \ldots) - \ldots - L_5(\phi_5 - c.q_5^{IV} - \ldots) \end{array}}{L_0 + L_1 + \ldots L_5}$$

$$= c \cdot \frac{L_0(q_0^{IV} + \ldots) + \ldots + L_1(q_1 + \ldots + L_5(q_5^{IV} + \ldots)}{L_0 + L_1 + \ldots + L_5}$$

or, when the quantities q^{IV} are evolved according to q_{ξ}^{IV} and its corresponding derivatives,

$$\delta = c.q_{\xi}^{IV} + \ldots$$

Placing this in (r), and observing that $q_{\frac{1}{2}}^{\text{IV}}$ may be expressed also by means of q_0 and higher derivatives from q_0, as well as by q_1^{IV} and higher derivatives of this quantity, and so on, there results:

$$f_0 = q_0 + c.q_0^{\text{IV}} + \ldots$$
$$f_1 = q_1 + c.q_1^{\text{IV}} + \ldots$$
$$\vdots$$
$$f_5 = q_5 + c.q_5^{\text{IV}} + \ldots$$

So that, according to these hypotheses, the amended values f and the true probabilities of death up to their derivatives of higher order agree together, as this value contains the first term of the theoretical error in the graduated values of q. But if the observations are not so extensive as to exclude errors of observation, then clearly only such errors, and not theoretical ones, can form part of f, and therefore the original theoretical error is in fact corrected for the most part in f.

The process of correction under discussion has this disadvantage, that, in spite of the equal intervals, it does not deal with the observations in a uniform manner, as within this interval they may include varying degrees from the first to the fifth. To remove this disadvantage, I take the grouping, not only for the intervals of five years following each other, but for every interval of five years from year to year, so that for each age a sum S is formed, which includes its own deviations as well as those belonging to the two preceding and two following years. The process now to follow arises almost self-evidently out of the foregoing, for if $\Sigma\Delta_{x-2}$, $\Sigma\Delta_{x-1}$ .. $\Sigma\Delta_{x+2}$ denote a column of deviations succeeding one another, the first of which refers to the ages $x-4, x-3 \ldots x$; the second to $x-3$ to $x+1$, and so on, and ΣL_{x-2}, ΣL_{x-1}, . . . ΣL_{x+2}, and the corresponding sums of the numbers living at risk, we have $\Sigma\Delta_{x-2}$ and ΣL_{x-2} as the common correction of q_{x-2}, q_{x-1}, q^x, q_{x+1}, and q_{x+2}, $\delta_{x-2} = \frac{\Sigma\Delta_{x-2}}{\Sigma L_{x-2}}$ and from $\Sigma\Delta_{x-1}$ and ΣL_{x-1} there also follows as the common correction of $q_{x-1} \ldots q_{x-3}$, $\delta_{x-1} = \frac{\Sigma\Delta_{x-1}}{\Sigma L_{x-1}}$, and so on. So that in place of q_x we finally obtain five new amended values, $q_x + \delta_{x-2}$, $q_x + \delta_{x-1}$, $\ldots q_x + \delta_{x+2}$, of which we take the mean as most suitable. Calling the amended value of q_x, thus derived $(f)_x$ we have:

$$(f)_x = \frac{(q_x + \delta_{x-2}) + (q_x + \delta_{x-1}) + \ldots + (q_x + \delta_{x+2})}{5}$$

$$= q_x + \frac{\delta_{x-2} + \delta_{x-1} + \delta_x + \delta_{x+1} + \delta_{x+2}}{5}$$

and the whole calculation, as far as amended results are concerned, resolves itself into this: That we collect the variations between actual and estimated deaths, and also between the numbers living at risk for each group of five years in succession, obtain the quotients from these two sums, and abbreviate these latter by taking the mean of each period of five years.

The ages at the commencement and end of the table require special treatment, for which the corresponding $\Sigma\Delta$, ΣL and δ cannot be obtained according to the general rule. They are, however, generally so small in number that a more exact correction becomes impossible. It seems to me to be more correct to calculate for the first and last n ages, which according to the numbers may be taken as a little greater or less than 10, a common correction, δ, on the basis of the material not made use of for the remaining corrections, so that finally each part of the collected material may be made use of for the emendations according to its true value. How this can be effected may be seen from the following Table:

(1) Index	(2)	(3)	(4)	(5)
(-2)	0	0	$L_0=\Sigma L_{-2}$	$\Delta_0=\Sigma\Delta_{-2}$
(-1)	0	0	$L_0+L_1=\Sigma L_{-1}$	$\Delta_0+\Delta_1=\Sigma\Delta_{-1}$
0	L_0	Δ_0	$L_0+L_1+L_2=\Sigma L_0$	$\Delta_0+\Delta_1+\Delta_2=\Sigma\Delta_0$
1	L_1	Δ_1	$L_0+L_1+L_2+L_3=\Sigma L_1$	$\Delta_0+\Delta_1+\ldots+\Delta_3=\Sigma\Delta_1$
2	L_2	Δ_2	$L_0+L_1+L_2+L_3+L_4=\Sigma L_2$	$\Delta_0+\ldots+\Delta_4=\Sigma\Delta_2$
3	L_3	Δ_3	$L_1+L_2+L_3+L_4+L_5=\Sigma L_3$	$\Delta_1+\ldots+\Delta_5=\Sigma\Delta_3$
:	:	:	:	:
$n-1$	L_{n-1}	Δ_{n-1}	$L_{n-3}+\ldots+L_{n-1}=\Sigma L_{n-1}$	$\Delta_{n-3}+\ldots+\Delta_{n+1}=\Sigma\Delta_{n+1}$
n	L_n	Δ_n	$L_{n-2}+\ldots+L_{n+2}=\Sigma L$	$\Delta_{n-2}+\ldots+\Delta_{n+2}=\Sigma\Delta_n$
:	:	:	:	:

The first column gives the index which represents the age, and in such a manner that the commencing age of the Table is represented by 0. The second contains the numbers living at risk; the third the deviation, Δ; while the fourth and fifth give L and Δ collected together, or ΣL and $\Sigma\Delta$. In this manner the plan is continued from the commencing age as long as values arise in (4) and (5) according to the general rule, if for the indices—1 and 2—the second and third columns are filled in with cyphers, and we have to imagine for ourselves a similar continuation for the end of the Table. Now we can see at once that the sums of the fourth and fifth columns must give five times the sum of the numbers living at risk, and five times the amount of the total variations between the actual and estimated number of deaths respectively. Therefore, if the regular calculation of corrections commences at age n, we obtain the unused remainder of the material above n, or, to speak more correctly, five times this quantity, by adding together the numbers in columns 4 and 5 from -2 to $n-1$. Let $\Sigma\Sigma L$ and $\Sigma\Sigma\Delta$ be the new amounts thus arrived at, we have then for the correction δ, common to the indices 0 to $n-1$,

$$\delta=\frac{\Sigma\Sigma\Delta}{\Sigma\Sigma L}=\frac{5\Delta_0+5\Delta_1+\ldots+5\Delta^n{}_{-3}+4\Delta_{n-2}+3\Delta_{n-1}+2\Delta_n+\Delta_{n+1}}{5L_0+5L_1+\ldots+5L_{n-3}+4L_{n-2}+3L_{n-1}+2L_n+L_{n+1}}$$

and a similar expression will suit for the correction of the last age. The treatment of the δ is, however, exactly the same as that of the δ_n, δ_{n+1} . . . &c., as calculated according to rule, and we have only to take care that in arriving at the mean we proceed as if the two indices preceding and following the actual commencement and end of

the Table respectively were also supplied with δ, as is indicated in the following scheme:

(-2)	δ	
(-1)	δ	
0	δ	$c = \delta$
1	δ	$c_1 = \delta$
2	δ	$c_2 = \delta$
:		:
$n-3$	δ	$c_{n-3} = \delta$
$n-2$	δ	$c_{n-2} = \frac{4\delta + \delta_n}{5}$
$n-1$	δ	$c_{n-1} = \frac{3\delta + \delta_n + \delta_{n+1}}{5}$
n	δ_n	$c_n = \frac{2\delta + \delta_n + \delta_{n+1} + \delta_{n+2}}{5}$
$n+1$	δ_{n+1}	$c_{n+1} = \frac{\delta + \delta_n + \delta_{n+1} + \delta_{n+2} + \delta_{n+3}}{5}$
$n+2$	δ_{n+2}	$c_{n+2} = \frac{\delta_n + \delta_{n+1} + \ldots + \delta_{n+4}}{5}$
$n+3$	δ_{n+3}	$c_{n+3} = \frac{\delta_{n+1} + \delta_{n+2} + \ldots + \delta_{n+5}}{5}$

and so on.

7.—Applications.

Through the emendation of the first graduation, as has been discussed in the preceding section, new trifling irregularities arise in the probabilities of death, and a second graduation is therefore required in order to arrive at a satisfactory final result. With regard to this, however, it seems to me desirable to apply, in the first graduation, a rationally-constructed formula, which is as simple as possible—such as, say, Higham's—and only to make use of the new and more exact formula in the final graduation. If in this process we take as a basis, not the probabilities of death themselves, but their logarithms, we need only fear a minimum of theoretical errors in the whole work, as the error which arose in the first graduation appears to have been removed by the emendation, and the logarithms only give rise to such as amount to a small fraction of those of Woolhouse's formula.

Formulæ (5) and (7), as is the case with every symmetrical formula of graduation, are not especially suitable for the commencement and end of the Table, since they contain terms which reach beyond those that have to be determined. If the numbers at the highest ages are considerable, and the observed probabilities of death run to 1 or thereabouts, we can arrive at the missing terms at the end of the Table in the first graduation by assuming the probability of death at the age next higher than the last one in the Table to $=1$.

The consequence will be, the graduated values will also rapidly approach 1, and forming a curve will exceed unity, finally remaining at that point. Before we proceed to the emendation, we must at once replace by 1 those values which exceed unity, and we must carry out the same process if the amended table itself yields any such, which can, however, be avoided, as we can increase the last δ at those ages for which it is negative. But if the probabilities exceed 1 even in the second graduation, or their corresponding logarithms exceed 0, they must be definitely set down as $=1$ or $=0$ respectively.

If, on the contrary, the last ages in the Table are of insufficient numbers, or if the Table ceases entirely at an age which we cannot accept as a natural conclusion, we must then prolong the original table in an artificial manner, by making use of the formula $q_x = b.c^x$, which very nearly answers to Gompertz's hypothesis, and at the higher ages yields very serviceable values. The necessary calculation takes the following shape. Let us suppose that the ages x to $x+n-1$, and $x+n$ to $x+2n-1$, to have a certain number of observations against them, and let n be a number which may be called 10 or 15 according to the extent of the material before us. We have then, according to this hypothesis:

$$q_x + q_{x+1} + \ldots + q_{x+n-1} = \sum_{x}^{x+n} q_x = b.c^x.\frac{c^n-1}{c-1}$$

and

$$q_{x+n} + q_{x+n+1} + \ldots + q_{x+2n+1} = \sum_{x+n}^{x+2n} q_x = b.c_{x+n}.\frac{c^n-1}{c-1}$$

from which there results

$$\log c = \frac{1}{n}\cdot\left(\log \sum_{x+n}^{x+2n} q_x - \log \sum_{x}^{x+n} q_x\right)$$

$$q_{x+2n} = \frac{c-1}{1-\frac{1}{c^n}}\cdot \sum_{x+n}^{x+2n} q^x$$

and

$$\log q_{x+2n+1} = \log q_{x+2n} + \log c$$

$$\log q_{x+2n+2} = \log q_{x+2n+1} + \log c$$

so that, after settling $\log q_{x+2n}$, we obtain the logarithms of the probabilities of death which follow by the continuous addition of $\log c$. The values obtained for q_{x+2n}, q_{x+2n+1} . . . &c., which can be continued as long as we choose, now take the place of the values of $x+2n$, $x+2n+1$ . . . &c., derived from actual observation, and the further operations, including the emendations, are computed exactly as in the previous case.

In the commencement of the Table it is desirable, where the numbers are considerable, to take a section out of the first five or ten probabilities of death, and to look upon these as values to be made use of for the preceding ages, by which means, in the first place, the first graduation will be rendered possible, and a foundation will also be provided for the second one. If, however, we have only small numbers of observations before us, we must calculate a starting-point from the numbers living at risk, and the deaths in the first five or ten years, which can then be made use of in the first graduation for these

and for the preceding years. Eventually we can also draw on other observations, and in such cases, especially, a certain margin must be left to individual judgment and skill. Any maximum or minimum which creeps into the increased material is consequently removed, both after the first and the second graduation, by allowing the value concerned to count in with those of the whole preceding portion, if the curve appears a natural one, or corresponds to other observations.

I have next tried the new process on the $H^{M(5)}$ Table, which is founded on a very extensive body of observations, and is of special interest, inasmuch as in the case of this Table, besides Woolhouse's graduation, a second graphic method originated by Sprague lies before us, which has been carried out in a thoroughly masterly manner (*J.I.A.*, vol. xxix., p. 65.) If we commence the Table, as Woolhouse does, at age 10 (Sprague takes an even younger age as a commencement), we find the observations for a number of years only scanty, and I have, therefore, in the first graduation, made use of the probability of death 0·0052, rated for the ages 10—19, which is in accord with the numbers of deaths in the following groups of ages, as well as with those observed in the same group, but for the assurance durations 0—4, as a common value for age 19 and the preceding ages.

Ages	Duration of Total Assurances		Duration of Assurances 0—4		Duration of Assurances 5 and upwards		
	Total Deaths	Probability of Death	Deaths	Probability of Death	Deaths	Probability of Death	
10–14	10	0·0038	6	0·0032	4	0·0055	0·0052
15–19	36	47	27	46	9	50	
20–24	232	69	191	65	41	94	
25–29	659	69	464	62	195	97	

There are no observations from age 97 on. Age 96 gives 1 as the probability of death, and therefore for 97 and onwards the value 1 is continuously inserted, and for the rest the proceeding is the same as that prescribed above for a similar case.

The results are shown in Table 6. In explanation of the calculation for corrections I add a section as Table 5. As will be seen, only 3-place logarithms have been made use of, which are quite sufficient for the purpose.

(*See* pp. 64 to 67.)

Sprague's graduation may be admitted to be very regular, although the second differences of the new graduation follow a somewhat more regular order than in his. It is noteworthy that the two graduations show, with one exception, a nearly parallel undulation of the mortality curve, which speaks well both for the reliableness of the observations and for the methods employed in dealing with them. The exception, which makes itself apparent in the ages 73 to 86, if we take second differences as a standard, arises from the circumstance that Sprague has undertaken a correction of the curve by anticipation in order partially to distribute a specially heavy observed mortality at age 73 among the later ages. Whether this proceeding is justifiable or not may remain undecided. At any rate, the new graduation conforms more exactly to the observed facts than that of Sprague, without showing any break, which certainly cannot be looked upon as a disadvantage.

To what extent both graduations reproduce the original

observations may be seen from the following Table, which takes into account both Woolhouse's method and the system of Higham, which I made use of in the first graduation. I have taken the results according to Woolhouse and Sprague from the essay by Sprague quoted above, which contains, by the way, a few errors which are here corrected.*

(*See* p. 68.)

The correspondence is very good in all the methods, but best according to the new one. That Woolhouse's total result is so favourable may besides be due, to a certain extent, to accident, and might not be repeated in every Table.

To give an example in which only a small amount of material comes under observation, I have also graduated the experience which was collected by the Bank of Gotha in connection with Protestant clergymen, the duration of assurance being six years and upwards. As may be seen from the following Table, the *data* are exceedingly scanty until age 30, and the numbers living and at risk cease at age 90, at which age the Bank of Gotha pays over the sum assured, even in the cases of whole life assurances. In consequence of these circumstances, a value was assumed for age 34 and the younger ages—in fact, the probability of death of the age-group 26-34 was taken as 0·0052 as a basis for the first graduation, while for the ages 86 and upwards an artificial extension of the table was made on the basis of the probabilities of death from 66 to 75 and from 76 to 85, according to the examples given above. In the calculation for correction, however, a common δ was fixed upon for the ages up to 34 and from 83 onward. The materials had already been graduated in the graphic manner, and in fact by myself (*see* "Die Abhandlung von Karup und Gollmer: Die Mortalitätsverhältnisse des geistlichen Standes, etc., Jahrbücher für Nationalökonomie und Statistik, Jena, Sechzehnter Band"), and I could therefore place a second column of figures over against those obtained by the new process.

(*See* pp. 69 to 71.)

(Note Table 8, p. 71.)†

These results are satisfactory, although not to the same extent as the former ones, and hence I draw the conclusion that it is necessary to have a body of observations of at least 2,000 well-divided cases of death, in order that the new method shall really be of value.

The new method supposes, according to its derivation, that the table to be graduated may be interpolated throughout by intervals of five years, and therefore it cannot be applied directly to the years of life extending from birth to about age five, within which

* Table B on page 97 of the essay gives the "Expected Deaths" according to Sprague for the age groups 54-58 and 59-65 as 10 too high and 10 too low respectively, in consequence of which the deviations are erroneously stated at 6·8 and −9·8 instead of 3·2 and −0·2.

† For the purpose of simplifying the calculation, and abbreviating the Table, the numbers arrived at by means of the formula are from this onwards replaced by 100·00. This alteration has affected the final values only slightly.

period the curvature of the curve of the probabilities of death changes rapidly, and is not continuous. We can, however, remedy this by constructing, with the assistance of averages, an artificial curve and an interpolation of the first or second order from the given (ungraduated) probabilities of death for the following eight or ten years, then carrying out the graduation in the usual manner, and finally adding thereto the differences between the assumed and real probabilities of death, after these differences have been themselves graduated. A similar proceeding may be followed if we wish to graduate a "Select Table" which has been graded according to duration of assurance, in which case the earlier years generally show an abnormal attitude. Further, it seems to me that the hitherto favourite method of collecting observations into groups of five years according to ages at entry, which are to be taken as representative of the mean, is not quite free from objection, since by this method the influence of the age relatively to the numbers at the different ages within the group is not sufficiently considered; and that we might expect more accurate results, if the observed facts, selected according to their importance, were divided, some into small, and some into longer periods of assurance, and were grouped and graduated within those periods, in effecting which the mechanical methods could be very suitably employed. Certainly in that case a definite revision would be necessary in order to obtain smooth transitions from one year of assurance to the next, and the work would so far turn out in the end to be somewhat more complicated than before.

That, as a matter of fact, the collecting of assured lives into groups of five years, according to ages at entry, has had some consideration, can be shown from Chatham's results, which, as is well known, refer to the male assured lives of the Bank of Gotha from 1829 to 1878, and were published in vol. xxix. of the *Journal* of the Institute. The cases of single ages mentioned in this review are those which Chatham obtained by means of supplementary interpolation from the rates of mortality calculated for the "mean age at entry."

The deviation between the numbers of deaths derived from the average rates and those derived from the previously calculated expectation, follow, as we see, a known law, and are by no means without significance. For the purposes aimed at by Chatham, his process seems, in fact, to have been sufficiently accurate.

(*See* Table 10, p. 73.)

Appendix.

The calculation of corrections between the first and second graduations, already explained in Table 5, can be considerably lightened by making use of the auxiliary Table subjoined at the end of this paper. (*See* pp. 76 and 77.) This Table contains within the first border an ordinary 3-place table of logarithms, with this difference, that certain mantissæ are wholly or partly underlined, by which means a more exact designation of the number corresponding to a given logarithm is rendered possible. For instance, if several consecutive logarithms are equal to each other, the one which gives the most correct number is wholly underlined, and if the difference between

any two consecutive logarithms is equal to that between the next two, the first or last figure respectively is underlined of that one which gives most accurately the number corresponding to the mean of the two mantissæ.

As an example, we find:

For logarithm	1·952	the number	89·5
„	„	2·536	„	„	344·
„	„	0·066	„	„	1·16

and in this manner the use of the otherwise usual antilogarithm tables, for logarithms of 3 and 4 places is avoided, which tables easily give rise to errors owing to their unaccustomed arrangement of numbers and mantissæ.

That part of the table which lies within the second border forms, to a certain extent, a separate table, and can be utilized to find the number necessary to increase each number of three figures to 1,000. That is to say, the numbers to the right of the table, printed in old English type, increase those found on the left to 100, and those numbers found in the first and second horizontal lines increase one another to 10, so that we have, for example, 666 as the complementary number for 334. The ρ prefixed signifies nothing else than a negative unity of the respective figures, and therefore the original numbers and those newly introduced are not really increased to 1,000 but to 0, as is shown in the following examples:

Complement of $278 = \rho 722$ (because $\begin{array}{l} \cdot\ {}^{-1}722 \\ = -278 \end{array}$

Complement of $431 = \rho 569$ (because $\begin{array}{l} {}^{-1}431 \\ = -569 \end{array}$

The special value of the contrivance just described rests upon the fact that for every logarithm appearing in the Table we can read off direct the complement of its appropriate number, by which means intermediate negative calculations are avoided. For instance, if the logarithms 2·455 and 2·984 are given, and we know that they relate to negative numbers, the Table gives for them $\rho 715$ and $\rho 036$, and if we have to add to those 481, 543 and 621, then the calculation runs as follows:

		$\rho 715$
		$\rho 036$
		481
		543
		621
Added	=	396

since the 2 which appears in the first place of the addition is annulled by the 2ρ or -2. Again, if we have numbers to subtract, where the subtrahend is sometimes greater and sometimes less than the minuend, and if we have to take out the logarithms of these numbers, we proceed as follows:

627	421	27	(or 027)
−961	266	−172	
$\rho 666$	155	$\rho 855$	

We then read off the corresponding logarithms from the Table, entering at the right or left side, according as to whether ρ is prefixed to the number or not.

In calculating by means of these complements and the sign ρ, certain rules must be observed, which arise of themselves from the signification of the latter. In the case of a number to which ρ is prefixed, we can always insert after the ρ as many nines as we please. For instance:

$$\rho 782 = \rho 9782 = \rho 99782$$

and

$$0{\cdot}0\rho 728 = 0{\cdot}\rho 9782 = \rho{\cdot}99782 = \rho 9{\cdot}99782$$

In determining the characteristic of the logarithm of a number to which ρ is prefixed, neither ρ nor the nines which follow it count, in so far as they stand before a decimal point; after the decimal point they are to be counted as cyphers, and on the other hand the cyphers following ρ are to be counted as places, so that

the characteristic of	$\rho 9978{\cdot}23$	$=1$	
„ „ „	$\rho 99{\cdot}9937$	$=7\ (-10)$	
„ „ „		or $=\bar{3}$	according to the English notation
„ „ „	$0{\cdot}000\rho 7$	$=5\ (-10)$	or $\bar{5}$
„ „ „	$0{\cdot}000\rho 992$	$=3\ (-10)$	„ $\bar{7}$
„ „ „	$\rho 0{\cdot}8$	$=0$	
„ „ „	$0{\cdot}00\rho 002$	$=6\ (-10)$	„ $\bar{4}$

A third rule, which has sometimes to be applied in the case of doubling numbers to which ρ is prefixed (multiplication by 0·2 instead of division by 5) is this, that -2ρ can be replaced by $\rho 8$.

The following example, which applies to the $H^{M(5)}$ Table and the first graduation carried out according to Higham's method, shows the manner in which the correcting calculation is carried out by the assistance of the new table. It appears at first sight rather full of detail, which arises from the fact that all the operations are fully repeated, including those which give as a result the divergences between the estimated and actual number of deaths. In reality, however, the calculation can be very easily and quickly accomplished, as a trial after a little practice will confirm.

(*See* Table 11, p. 75.)

When logarithms, such as those in col. log Z_x, refer partly to complementary numbers, we must always keep their origin in view. This is rather burdensome, and on that account it is perhaps desirable to distinguish each logarithm which refers to a complementary number in some definite manner, say by means of an appended letter.

Aperçu succinct des Théories du Plein de l'Assurance.

Par CORNEILLE L. LANDRÉ,

Actuaire de la Société générale néerlandaise d'Assurances sur la vie à Amsterdam.

Il est difficile de donner de bonnes définitions ; on se demande souvent, si l'on ne perd pas un temps précieux à en chercher et si l'on ne fait pas mieux en y renonçant et en donnant des descriptions et des indications.

Lorsqu'il s'agit de choses et d'idées qui ont une signification bien déterminée, les rechercheurs de définitions peuvent se creuser l'esprit pour trouver les mots propres, mais la tâche est bien autrement difficile quand on ne sait pas trop bien soi-même de quoi l'on parle.

Par ex. qu'est-ce qu'un actuaire ? Dans quelques compagnies d'assurances sur la vie c'est une espèce de directeur qui se mêle de tout, et dont les décrets sont décisifs ; dans une autre compagnie c'est un calculateur dont on aimerait mieux pouvoir se passer ; selon l'un ça doit être un mathématicien de premier ordre et surtout de renommée ; selon l'autre l'actuaire ne doit pas être trop savant ; mais selon tout le monde il doit être toujours prêt à répondre à toutes les questions où il entre des nombres. Il est vrai que le bon énoncé d'un problème forme le commencement de la solution ; mais la distance du commencement à la fin n'est pas toujours une quantité négligeable, après tout est-il plus facile de faire mille questions que de résoudre un seul problème. Il y a des questions auxquelles l'actuaire ne cherche pas la réponse ; il y en a d'autres qui l'intéressent vivement, mais qui n'ont pas encore trouvé une solution définitive.

Il y a des gens qui parlent d'une science actuarienne, il y en a d'autres qui disent, qu'il n'y a question ici que d'une application assez limitée de l'arithmétique ; il est vrai que pour calculer les primes et les réserves des assurances les plus usitées d'après des bases données, il n'est pas nécessaire d'être un grand savant ; mais il n'est pas moins vrai, que l'assurance pose des questions bien plus difficiles et donne lieu à des études étendues. Toujours est-il qu'il y a des savants de premier ordre qui n'ont pas dédaigné de mettre leur science au service de l'assurance sur la vie, qu'ils ont su y appliquer les branches les plus profondes des mathématiques et qu'en récompense ils ont eu la satisfaction, que l'assurance aussi a donné lieu au développement des mathé-

matiques pures. Nous ne sommes pas loin de pouvoir parler d'une algèbre financière. Celui qui voue sa vie aux mathématiques pures se demande parfois : " What shall I do with it " (Qu'en ferai-je) ? Non sans quelque étonnement il trouve souvent une réponse, quand il entreprend d'appliquer sa science aux problèmes que l'assurance lui pose.

Un des problèmes que tout assureur doit nécessairement résoudre, est celui-ci : Quelle est la somme la plus élevée que je puisse assurer sur une seule tête ou sur une combination de têtes ? Cette somme la plus élevée se nomme le *plein* de l'assurance. Aucun assureur n'ignore qu'il faut établir une limite supérieure au-delà de laquelle il ne doit pas être accepté une assurance individuelle, sachant qu'une trop grande somme exposerait la compagnie au danger d'une perte trop considérable ; mais il y a lieu de croire que ce nombre est le plus souvent assez arbitrairement arrêté, de sorte qu'il serait assez difficile à plusieurs assureurs de dire pourquoi ils fixent tel maximum et non un autre.

Il ne faut pas s'en étonner, moins encore en faire un reproche. Nous autres actuaires nous avons quelque droit à être un peu fiers des données statistiques qui servent de bases à nos calculs, bases qui manquent à peu près absolument dans plusieurs branches d'assurance ; quand nous calculons nos primes pures nous savons très bien ce que nous faisons ; encore reste-t-il l'arbitraire du choix des tables et du taux de l'intérêt, et puis quand nos primes pures sont prêtes il nous reste à faire le choix du chargement ; certes, il y a d'excellentes méthodes selon lesquelles on peut déterminer les primes du tarif d'après un système fixé d'avance, qui tient compte des différentes causes du chargement ; mais quant aux nombres absolus les mathématiques ne savent nous délivrer de l'arbitraire, qui entre dans l'évaluation de quelques-uns d'entre eux.

Notre fierté va encore en diminuant quand il s'agit de fixer les surprimes pour les voyages, le risque de guerre, pour les risques anormaux à cause d'un état médiocre de la santé ou même à cause de la prédisposition héréditaire ou non à certaines maladies. Je ne puis m'empêcher de croire que plus d'une fois l'actuaire se trouve tiré d'embarras, quand il peut s'emparer d'un exemple ou quand il peut s'en reporter au médecin consultant, qui tranche la question en attribuant au candidat un âge ou en limitant la durée de l'assurance. Cependant nous pouvons nous féliciter de ce que plus d'un actuaire éminent voue ses talents à la question importante des risques anormaux et que leurs recherches, loin d'être inutiles ou purement théoriques, mèneront probablement bientôt à une excellente solution.

S'il y a donc encore tant d'arbitraire dans plusieurs questions qui ont l'air assez simple, les difficultés deviennent bien plus grandes quand il n'y a pas seulement à faire un choix de quelques nombres à substituer dans une formule, mais quand on n'est pas même sûr de la formule qu'il faut appliquer, et qu'on a encore à faire le choix des principes dont il faut partir. Dans ce cas il y a l'arbitraire de deux côtés, celui de la méthode et celui du nombre.

Je ne crois pas me tromper en disant que le problème du plein doit être compté parmi ces questions difficiles qu'on pose à l'actuaire.

C'est pourquoi je prends la courage de présenter au congrès un aperçu des diverses méthodes pour déterminer le plein ; je ne le fais qu'avec beaucoup d'hesitation, car je suis bien sûr que dans cette

réunion plusieurs actuaires en savent plus que moi; j'ose le faire dans l'espoir que quelques-uns parmi vous se trouveront animés à publier leurs idées non seulement au profit de la science mais pas moins au profit de la pratique. Il est probable, plutôt certain que la revue que je vais donner n'est pas complète; je vous prie de ne pas m'en faire un trop vif reproche; je croirais avoir fait œuvre non inutile si mes humbles efforts donnaient lieu à des études plus fertiles.

Il y a la méthode de la somme moyenne assurée sur une tête, du moins lit-on ça et là le conseil, que la somme assurée ne doit pas trop s'éloigner de cette moyenne. Celui qui suit cette méthode accepte pour plein un certain multiple de cette moyenne; cette moyenne est un nombre bien déterminé; mais l'arbitraire consiste dans le choix du multiple. La simplicité de la méthode est sans doute un grand avantage; mais cela ne serait pas une raison suffisante pour l'accepter; il y a pourtant d'autres raisons qui la recommandent: en composant nos tarifs nous sous-entendons tacitement que non seulement un grand nombre d'assurés se présentera pour chaque âge en proportion des nombres de la table de mortalité; mais que chaque personne sera assurée pour la même somme. Plus la réalité répond à cette supposition, moins les grandes déviations sont probables. Si toutes les personnes étaient assurées pour la même somme, une déviation avantageuse de la mortalité irait toujours de pair avec une déviation avantageuse des sommes payées; plus d'une fois le contraire a lieu, il arrive que le nombre des décès est avantageux, tandis que les sommes payées sont défavorables à la compagnie. Dans l'impossibilité où sont les compagnies d'assurer sur chaque tête la même somme, il n'y a rien d'étrange qu'elles évitent une trop grande différence et acceptent ainsi un plein en proportion de la moyenne, ce qui ne dit pas encore que cette méthode soit la meilleure. Aussi ne saurait-on contredire qu'elle présente de sérieuses difficultés. Prenons deux compagnies dont l'une a assuré fr. 100,000,000 sur 50,000 têtes, donc fr. 2,000 par tête, l'autre fr. 10,000,000 sur 500 têtes, donc fr. 20,000 par tête. Supposons que les deux compagnies acceptent le facteur 5 comme multiple de la moyenne qui donne le plein; la première compagnie prendrait fr. 10,000, la seconde fr. 100,000 pour plein. Cependant il est facile de voir qu'en général la première compagnie supporterait bien plus facilement que la seconde un sinistre de fr. 100,000. Si donc la moyenne doit être la base du plein, le facteur doit être bien différente d'une compagnie à l'autre.

Mais il y a plus; sans aucun calcul il est clair, qu'au point de vue de la mortalité une perte prochaine à laquelle une même assurance expose la compagnie, est plus petite à mesure que la durée des primes est moindre. A ce point de vue les compagnies devraient préférer les primes uniques et le plein devrait donc aussi dépendre de la manière dont se paient les primes. Il est vrai pourtant que s'il y a lieu de craindre un abaissement continuel du taux de l'intérêt, les primes uniques ne mériteraient plus la préférence pour les compagnies.

Le plein ne doit pas moins dépendre de la mode d'assurance p.e. il peut être bien plus grand pour les assurances en cas de vie que pour les assurances temporaires en cas de décès, et entre ces deux formes l'assurance mixte tient le milieu. Encore faudrait-il prendre en considération l'âge du contractant et il serait facile d'énumérer encore bien plus de raisons, pour lesquelles un multiple constant de la

moyenne est loin d'être un nombre rationnel pour déterminer la somme maxima qu'une compagnie peut assurer sur une tête.

Je crois en avoir dit assez pour motiver les recherches qui ont été faites pour donner une théorie mathématique du plein, non seulement pour l'importance scientifique de la question, mais pas moins dans le but pratique de donner à l'actuaire le moyen de se rendre un compte exact des raisons, pourquoi il accepte cette somme-ci et non celle-là pour limite, au-delà de laquelle la compagnie ne doit pas aller.

Je tâcherai de donner un aperçu succinct des diverses théories; c'est pourquoi je ne donnerai pas le développement des formules, mais je me bornerai aux idées fondamentales qui les ont fait naître. L'ordre chronologique se recommanderait sous un point de vue historique; parce que moi-même je me suis un peu occupé du sujet, je préfère l'ordre, suivant lequel j'en ai pris connaissance.

D'abord j'ai encore à faire observer qu'en lisant l'excellent livre de Dormoy: "Théorie mathématique des Assurances sur la Vie," je vis qu'en traitant dans le premier tome la théorie des écarts, il promet d'appliquer dans le second tome cette théorie à celle du plein, et en lisant le second tome ce me fut une déception de voir que Dormoy renvoie ses lecteurs au "Traité du Calcul des Probabilités" de M. Laurent. J'aurais tant aimé lire Dormoy lui-même à ce sujet.

La théorie du plein a été traité par M. Laurent plus d'une fois; dans le *Journal des Actuaires français* (t. II. 1873) il a publié un article intitulé: "Détermination des Pleins qu'un Assureur peut garder sur les Risques qu'il garantit." Dans ce premier essai M. Laurent considère les diverses affaires en cours indépendamment de la manière dont les primes se paient, ce qui revient à dire que tacitement les seules primes uniques entrent en ligne de compte. On y trouve déjà la même admirable analyse mathématique et les mêmes principes supérieurs du calcul des probabilités dont M. Laurent sait se servir si heureusement.

Si le travail de M. Laurent à ce sujet n'a pas joui de toute l'appréciation qu'il aurait mérité, ça tient, il me semble, en partie à ce qu'il a probablement trop confié à l'étude du lecteur. P.e. la méthode de M. Laurent suppose que chaque affaire isolée doit être répresentée de manière, qu'elle donne lieu à plusieurs paiements y compris le paiement zéro, tellement que la somme des probabilités des divers paiements soit toujours égale à l'unité, et par les divers paiements il faut toujours entendre les valeurs actuelles.

Au premier abord il n'est pas bien clair, que dans tous les cas, la somme des probabilités des divers paiements eventuels est toujours égale à l'unité; pour l'assurance vie-entière ou l'assurance mixte et dans tous les cas que la somme sera certainement payée une fois et jamais plus d'une fois, cela est fort clair; mais quand il s'agit p.e. d'une rente viagère et que l'on considère chaque paiement à part, la somme des probabilités est bien plus grande. Il est vrai pourtant qu'on peut réduire les divers paiements en cas de vie à des paiements en cas de décès; à cet effet on suppose qu'à la mort les rentiers reçoivent la valeur de tout ce qui leur était dû leur vie durant, y compris l'intérêt. Les formules en deviennent pourtant bien plus compliquées que les formules ordinaires.

Dans son "Traité du Calcul des Probabilités" et puis à peu près de la même manière dans sa "Théorie et Pratique des Assurances sur la Vie," M. Laurent traite son sujet plus à fond et tient compte des diverses manières

de payer les primes. Il donne d'abord la formule de la somme maxima (ou plutôt sa valeur actuelle) que la compagnie aura à payer pour les assurances en cours, puis la valeur actuelle minima des primes à recevoir ; en soustraiant celle-là de celle-ci, il trouve le gain minimum que la compagnie peut attendre sur l'ensemble de ses affaires.

Pour déterminer le plein d'une nouvelle assurance M. Laurent met la condition, qu'elle ne diminue pas le gain maximum.

En parlant d'un gain maximum, il va sans dire que M. Laurent ne parle pas du maximum absolu ; quand tous les assurés en cas de décès meurent en une année et que tous les assurés en cas de vie atteignent la limite de l'âge, la compagnie, au lieu de gagner, subit la perte maxima. Quand tous les assurés en cas de vie meurent demain et que tous les assurés en cas de décès atteignent la limite de l'âge, la compagnie remporte le gain maximum.

M. Laurent calcule le gain minimum de manière que ce gain ait une probabilité très voisine de l'unité, ici 0·99997. Voilà sans doute une grande probabilité ; mais on ne peut manquer d'observer que pour les mêmes primes le plein de M. Laurent diminuerait de beaucoup, si l'on voudrait se contenter d'une probabilité inférieure p.e. 0·999.

Lorsque M. Laurent diminue la valeur minima des primes de la valeur maxima des indemnités pour obtenir la valeur minima du gain, il entend par ses primes non les primes pures, mais les primes chargées telles que les assurés les paient et cela n'est que naturel dans sa théorie. Il faut pourtant un mot pour prévenir un malentendu. Pour une compagnie qui a existé quelques années, la valeur actuelle des primes futures est inférieure à celle des indemnités ; quand on soustrait la valeur maxima des indemnités de la valeur minima des primes futures on obtient donc un nombre négatif.

Il est ainsi impossible d'entendre par les primes à recevoir de M. Laurent les primes futures, il faut que pour chacune des affaires en cours on entende par la valeur actuelle des primes celle de toutes les primes tant passées que futures et par la valeur des indemnités il faut entendre non seulement celle des indemnités futures, mais celle des indemnités tant passées que futures, dans la supposition que pour les affaires en cours la mortalité a eu lieu selon la table de mortalité qui sert de base au calcul et que les capitaux ont rapporté un interêt selon le taux choisi. Cette méthode est conforme à la considération de M. Laurent, selon laquelle tout le chargement sert à augmenter le gain ; tandis que les frais d'administration sont prélevés sur ce gain. Selon cette méthode on se rend indépendant de la manière dont on veut calculer la réserve, qui dans cette considération fait partie du gain.

La formule finale qui doit décider si une nouvelle affaire est acceptable est celle-ci :

$$u_k - x_k > 3\left[\frac{y_k - x^2{}_k}{\sqrt{2\Sigma(y-x^2)}} + \frac{v_k - u^2}{\sqrt{2\Sigma(v-u^2)}}\right],$$

dans laquelle pour une seule assurance O_i on a :

$$x_i = p_{i,1}\, a_{i,1} + p_{i,2}\, a_{i,2} + p_{i,3}\, a_{i,3} + \ldots$$
$$y_i = p_{i,1}\, a^2{}_{i,2} + p_{i,2}\, a^2{}_{i,2} + p_{i,3}\, a^2{}_{i,3} + \ldots$$

les a sont les valeurs actuelles des indemnités eventuelles pour l'affaire,

les p sont les probabilités de ces indemnités, tandis que les indemnités s'entendent de manière que la somme de toutes les probabilités est l'unité.

Pour la même affaire on a :

$$u_i = q_{i,1}\, b_{i,1} + q_{i,2}\, b_{i,2} + q_{i,3}\, b_{i,3} + \quad . \quad . \quad . \quad . \quad .$$
$$v_i = q_{i,1}\, b^2_{i,1} + q_{,2}\, b^2_{i,2} + q \quad b^2_{i,3} + \quad . \quad . \quad . \quad . \quad .$$

les b sont les valeurs actuelles des primes et les q leurs probabilités respectives, tandis que la somme des q est encore l'unité.

$\Sigma\,(y-x^2)$ et $\Sigma\,(v-u^2)$ sont les sommes des grandeurs $y-x^2$ et $v-u^2$ pour toutes les affaires en cours.

Les grandeurs x_k, y_k, u_k, v^k, se rapportent à une nouvelle affaire O_k. Or x_k n'est que la valeur actuelle de l'assurance ou l'espérance mathématique de l'assuré, autrement dit c'est la prime unique pure de l'assurance, u_k est la valeur actuelle des primes, non des primes pures, mais des primes chargées telles que l'assuré les paiera. D'ailleurs la formule montre que si le chargement d'une nouvelle assurance était nul, elle ne serait pas admissible selon la théorie de M. Laurent, car $u_k - x_k$ serait nul ; $u_k - x_k$ est la valeur actuelle du chargement. Selon cette théorie le plein peut donc être plus grand à mesure que les nombres $\Sigma\,(y-x^2)$, $\Sigma\,(v-y^2)$ et le chargement sont plus forts.

Tout en admirant la remarquable analyse de M. Laurent, il y avait pour moi dans sa théorie quelques difficultés à surmonter, puis le nombre choisi 3 dans sa formule est toujours arbitraire, le changement de 3 en 2 permet un plein bien plus grand, et je ne pouvais admettre qu'une assurance contre des primes pures devrait être prohibée dans toutes les circonstances. Je me représente un cercle d'hommes qui se proposent de s'assurer mutuellement des capitaux différents en cas de décès contre des primes pures ; s'il y a quelques frais d'administration les assurés les paient chaque année en proportion de leurs primes ou de leurs capitaux assurés ; lorsque, la réserve établie, le bilan indique un gain, celui-ci est distribué aux participants ; lorsque au contraire le bilan indique une perte, les assurés font un versement extraordinaire, c'est bien là à mon avis la véritable mutualité, je ne sache pas qu'il faille défendre cette manière de s'assurer ; mais est-ce à dire qu'il soit sage d'accepter les plus fortes assurances ; ne reste-t-il pas vrai que les trop fortes sommes exposent la compagnie à de trop grandes pertes ? Indépendamment du chargement il y a donc un plein qu'il serait imprudent de surpasser.

C'est pourquoi j'ai fait un effort pour traiter la théorie du plein d'une autre manière dans mon livre apparu en hollandais sous le titre : "Wiskundige hoofdstukken voor levensverzekering" et en allemand sous le titre, "Mathematisch-technische Kapitel zur Lebensversicherung."

En prenant pour point de départ la théorie des écarts telle qu'on la trouve en Dormoy et dans la "Mathematische Statistik" de Wittstein, j'ai d'abord donné les formules pour l'écart moyen pendant une année, ou comme Wittstein l'exprime le risque mathématique. Je croiais devoir me borner à l'écart pendant une année, parce que les comptes se dressent chaque année et que l'écart n'en change pas moins d'un moment à l'autre, quand on l'aurait établi pour toute la durée des contrats. Il me semblait nécessaire de considérer qu'au moment du paiement d'un sinistre, l'avoir de la compagnie ne diminue pas du capital assuré, mais de la différence entre ce capital et la réserve.

Soit A le capital d'une assurance en cas de décès, V la réserve en caisse au commencement de l'année pour l'unité de capital ; V′ la réserve telle qu'elle sera à la fin de l'année en cas de survie, w la probabilité que l'assuré meure dans le cours de l'année, l'écart moyen est pour la totalité des assurances en cas de décès égal à

$$\frac{1}{2\pi}\sqrt{\Sigma A^2(1-V')^2w(1-w)}$$

Il est utile de faire observer, que pour plus de simplicité il est supposé que les sinistres se règlent à la fin de l'année du décès.

Le symbole Σ indique la sommation des nombres.

$$A^2(1-V')^2w(1-w)$$

calculés pour chaque assurance à part.

Je nommerai ce nombre *risque mathématique annuel* pour le distinguer du risque mathématique pour toute la durée des contrats.

Pour les assurances en cas de vie le risque mathématique annuel est

$$\frac{1}{2\pi}\sqrt{\Sigma A^2V'^2w(1-w)}$$

Dans cette considération la somme que la compagnie verse à la réserve est une dépense, un paiement au profit des assurés.

Le paiement probable est donc

$$\Sigma A(1-V')w+\Sigma A[V'-(1+i)V]$$

pour les assurances en cas de décès ; tandis que pour les assurances en cas de vie ce paiement probable est

$$\Sigma AV'(1-w)-\Sigma A(1+i)V\,;$$

i est l'intérêt de l'unité par an.

Inutile de donner ici les formules pour d'autres formes d'assurance.

Maintenant j'ai emprunté à la méthode des moindres carrés le théorème : quand ε_α, ε_β, ε_γ, ... sont les écarts moyens pour diverses formes d'assurance, tandis que E est l'écart moyen total, on a :

$$E^2=\varepsilon_\alpha{}^2+\varepsilon_\beta{}^2+\varepsilon_\gamma{}^2+\ \ldots$$

Il est hors de doute que toute nouvelle assurance augmente le risque mathématique ; plus la somme totale assurée est grande, plus les grands gains et par cela même les grandes pertes sont possibles ; la petite probabilité des grandes pertes n'exclut pas la possibilité. Cet agrandissement du risque mathématique est inévitable et ne fait pas de mal, pourvu qu'il ne soit pas par trop grand. Il faut cependant qu'il y ait un rapport rationnel entre la perte possible et la force de la compagnie.

Celle-ci ne réalise pas de gain ni ne subit de perte, quand le paiement effectif est égal au paiement probable pendant une année. C'est pourquoi j'ai introduit le *risque relatif* et j'entends par là le quotient du risque mathématique annuel et du paiement probable. S'il n'y a question que d'assurance en cas de décès, ce risque relatif est

$$\frac{1}{2\pi}\,\frac{\Sigma A^2(1-V')^2w(1-w)}{\Sigma A(1-V')w+\Sigma A[V'-(1+i)V]}\,.$$

Il m'a semblé qu'une nouvelle assurance, tout en augmentant forcément le risque mathématique annuel, ne devrait pas augmenter le risque relatif. On obtiendrait donc le plein x d'une nouvelle assurance quelconque en introduisant la nouvelle affaire avec le capital x dans le risque mathématique annuel et dans le paiement probable ; en exprimant que le nouveau risque relatif est égal au risque relatif ancien, on trouve le plus grand capital x qu'on puisse accepter sur l'assurance en question.

Il est vrai que l'application de la méthode donnerait lieu à des calculs assez compliqués, pourtant pas plus compliqués que ceux d'après la méthode de M. Laurent.

D'ailleurs je sais très bien que plusieurs circonstances peuvent faire accepter un plein bien plus grand, il y a entre autres le chargement des primes. Si donc la méthode ne peut pas être appliquée sans modification, il me semble pourtant qu'elle peut donner une idée de l'influence d'une nouvelle affaire sur un nombre bien déterminé, ici le risque relatif, nombre qui, à mon avis, serait propre à donner une certaine mesure de solidité. Toujours est-il que j'ai la satisfaction, que mes études à ce sujet en ont animé d'autres à étudier la question.

Après l'apparition de mon livre j'ai encore traité le sujet dans un périodique hollandais, *Archief voor de Verzekeringswetenschap en aanverwante vakken* ; puis dans le journal, *Oesterreichische Versicherungs-Zeitung*, dans lesquels j'ai fait quelques observations sur la méthode de M. Laurent. Quelque temps après M. le Dr. Mounier a donné ses idées dans le même périodique hollandais sous le titre "Iets over Risico-reserve." Dans cet article M. Mounier compare deux traités sur la Risque de l'assurance, savoir celui de Bremiker et celui de Wittstein. En se basant sur la théorie de Wittstein sur le risque pour toute la durée des contrats et en appliquant les principes de la méthode des moindres carrés, il veut déduire l'erreur (l'écart) probable (M) de la totalité des affaires, de l'erreur moyenne.

Ensuite M. Mounier prescrit une réserve de risque au montant d'un certain multiple de cette erreur probable M. S'il prend cette réserve égale à 5 M, il obtient la probabilité $\frac{999}{1000}$ que la compagnie pourra remplir ses devoirs vis-a-vis des assurances en cours.

Le but principal de M. Mounier était ainsi de donner une méthode pour déterminer la réserve de risque en vue d'un certain degré de solidité ; il applique ensuite sa théorie pour déterminer la plus grande somme qu'une compagnie puisse accepter pour une seule assurance donnée ; il veut fixer cette somme de manière que 5 M ne devienne jamais plus grand que la somme qui peut être mise à part comme réserve de risque.

M. Mounier ne se dissimule pas que sa méthode mène à des calculs effrayants, qui la rendent inapplicable, cependant il entrevoit la possibilité, que la pratique saura déduire de ces principes une méthode maniable.

Il finit par dire, qu'il ne faut pas exagérer l'importance de sa théorie, puis qu'il y a d'autres facteurs qui doivent entrer en ligne de compte hors le seul écart de la mortalité.

Dans le second volume des *Papers and Transactions* de l'Institut : *Actuarial Society of America*, M. Clayton C. Hall a donné une théorie du plein sous le titre :—"A Method of Measuring the Maximum Amount

which an Insurance Company may properly assume upon a single risk," M. Hall part de la formule de Wittstein pour l'écart moyen :

$$R = \frac{1}{\sqrt{2\pi}} \sqrt{lp\,(1-p)}$$

dans laquelle p est la probabilité de survivre à la fin de l'année, l le nombre de ceux qui au commencement de l'année ont cette probabilité dans la compagnie ; or $l\,(1-p)=d$ est la nombre probable des décès pendant l'année, de sorte que l'écart moyen peut s'écrire :

$$R=0{\cdot}3989\,\sqrt{d\,(1-q)},$$

où q est la probabilité de mourir pendant l'année.

Sachant que le nombre q est généralement une fraction relativement petite, M. Hall en conclut que la plus grande somme qu'on puisse accepter, doit être proportionnelle à la racine carrée du nombre probable des sinistres, ou plutôt à l'écart moyen de l'indemnité probable.

Quoique la méthode de M. Hall ne fasse mention que de l'assurance en cas de décès, dont l'assurance mixte peut faire partie dans ces considérations, et qu'il ne tienne pas compte de la réserve en caisse, ni de l'âge des assurés, on ne saurait contredire que sa méthode est déjà meilleure que celle de la moyenne et qu'elle cherche dans la bonne direction. Les exemples de M. Hall et la discussion dans une réunion du dit Institut montrent qu'on ne saurait accepter un multiple invariable de l'écart moyen. D'ailleurs M. Hall lui-même veut tenir compte des circonstances particulières des compagnies, circonstances qui ne sont pas toutes propres à être exprimeés dans une formule mathématique.

Pendant la discussion M. Hall a fait observer qu'on peut considérer la question de différents points du vue. On pourrait faire la distinction si une compagnie veut assurer en pleine sécurité (safely) ou avec une sage prudence (properly).

Je voudrais y ajouter encore quelques mots : on peut exiger que chaque nouvelle assurance améliore la situation de la compagnie, ou l'on peut admettre toutes les assurances nouvelles, qui n'exposent pas la compagnie à une grande perte possible. Si je ne me trompe, M. Hall et moi nous nous sommes placés dans nos théories au premier point de vue, sans condamner le second.

Monsieur H. Onnen a composé en 1896 sa dissertation inaugurale pour l'obtention du grade de docteur ès-sciences et a fait choix du *plein de l'assurance*, sous le titre " Het Maximum van Verzekerd Bedrag."

Il est impossible de suivre cette dissertation dans tous ses détails ; on pourrait la regarder comme un commentaire et une modification de la théorie de M. Laurent. M. Onnen ne donne pas à part la valeur des primes et celle des paiements ; selon lui la valeur de l'assurance n'est que la réserve, savoir la réserve calculée sur la base des primes pures.

En posant l'erreur moyenne de la compagnie=E, il trouve la probabilité 0·999999 que la valeur effective des assurances s'écartera de la réserve (la valeur probable) d'un montant inférieur à 5E.

Ensuite en posant la réserve=V, il exige un chargement de

risque $a = \frac{5E}{V}$ pour faire face aux écarts. Ce chargement de risque servira à former une réserve de risque.

On peut différer d'opinion sur la manière dont on pourrait former cette réserve de risque, je n'y reviendrai pas ici ; dans un journal hollandais M. Onnen et moi avons donné nos opinions à ce sujet.

Quant au plein M. Onnen veut le déterminer de manière que pour une nouvelle assurance la réserve de risque ne devienne jamais inférieure à 5E. Je crois pourtant que dans la théorie de M. Onnen il faut entendre par la réserve de risque la valeur actuelle du chargement de risque

Cependant M. Onnen n'attribue pas trop de valeur à ses considérations théoriques. Il dit entre autres : " Pour la pratique cela (cette théorie) est sans valeur. Il sera sage de raisonner et d'agir pratiquement et de ne se cramponner aucunément à une formule. Qu'on choisisse un chargement assez large et qu'on détermine la réserve ordinaire et la réserve de risque à des termes fixés conformément à la situation momentanée de la compagnie. Ces deux montants établis, il ne faut pas craindre de n'avoir recours à la réassurance que dans des cas exceptionnels en observant les exigences de la solidité."

M. Onnen veut donc bien démontrer, ce qu'il dit d'ailleurs, que le problème du plein est un problème indéterminé, et dans sa première thèse il dit exprès : " Il serait désirable de bannir l'expression : *somme maxima à assurer* de la théorie mathématique des assurances sur la vie et de ne parler que du risque," de sorte que nous nous voyons rejetés dans le vague.

Du reste la dissertation de M. Onnen contient des critiques de diverses théories, la mienne y comprise, et je conviens qu'il n'a pas toujours tort. Il serait difficile de relever tous les points sur lesquels les opinions sont encore divergentes ; mais il est agréable de constater que par suite des discussions elles se sont rapprochées sur plus d'un point.

Dans le journal, *Oesterreichische Versicherungs-Zeitung*, du 28 novembre et du 12 decembre, 1896, M. R. Schönwiese traite le sujet du plein dans un article intitulé : " Das Maximum der Versicherungs-Summe."

Comme M. Hall et moi, M. Schönwiese ne prend en considération qu'une seule année, il ne trouve pas nécessaire, même moins bon, de calculer le risque pour toute la durée des contrats, puisque le risque d'une assurance va en diminuant à cause de la réserve, et qu'il est moins prudent de se sauvegarder contre une perte prochaine par un gain lointain. D'ailleurs le calcul de chaque année le rend possible de faire abstraction de l'intérêt.

M. Schönwiese commence par les assurances pour lesquelles il ne se forme pas de réserve mathématique, p. e. les assurances en cas de décès pendant une année et les assurances contre les accidents.

En passant aux assurances pour lesquelles il se forme une réserve, M. Schönwiese n'a qu'a remplacer les capitaux assurés par les capitaux diminués de la réserve telle qu'elle sera à la fin de l'année.

Soient les capitaux assurés s_1, s_2, s_3, . . . s_n, les probabilités que les événements donnant lieu au paiement de ces capitaux, se présenteront dans le cours de l'année, soient q_1, q_2, q_3, . . . q_n ; alors les primes pures de ces assurances sont

$$s_1 q_1,\ s_2 q_2,\ s_3 q_3,\ \ldots\ s_n q_n$$

et la totalité des primes est

$$\Sigma s_k q_k = \mathrm{L}.$$

Maintenant M. Schönwiese exige un chargement de risque z_k par unité, ensuite il suppose que la compagnie est en possession d'une réserve de risque au montant de G, alors pour faire face aux paiements, la compagnie dispose de la somme

$$\mathrm{L} + \mathrm{G} + \Sigma s_k z_k$$

Conformément aux règles du calcul des probabilités M. Schönwiese forme la somme

$$b = \Sigma\, s_k^{\,2}\, q_k\, (1 - q_k),$$

il pose la probabilité P que le paiement soit plus de m, et il obtient la formule

$$\mathrm{P} = \frac{1}{\sqrt{\pi}} \int_{\rho}^{\infty} e^{-t^2}\, d\, t$$

où

$$\rho = \frac{m - \mathrm{L}}{\sqrt{2\, b}}$$

il s' en suit $\qquad m = \mathrm{L} + \rho \sqrt{2}.\ \sqrt{b}.$

Pour que la compagnie ait la solidité nécessaire il faut qu'elle ait à sa disposition outre les primes pures (L), la somme $\rho \sqrt{2}.\ \sqrt{b}$.

Selon M. Schönwiese il suffirait le plus souvent de prendre P = 0·01, d' où il suit $\rho = 1{,}645$; dans ce cas la compagnie se contente de la probabilité 0·99 qu'elle pourra régler ses sinistres.

Selon les suppositions la compagnie peut disposer de la somme

$$\mathrm{G} + \Sigma\, s_k\, z_k$$

pour servir aux écarts désavantageux.

La différence $\mathrm{U} = \mathrm{G} + \Sigma\, s\, z_k - \rho \sqrt{2}\, \sqrt{b}$

décide s'il y a gain ou perte, gain si U est positif, perte si U est négatif.

Par une nouvelle assurance la grandeur U change en U + Δ U ; pour qu'elle ne soit pas désavantageuse il faut que Δ U ne soit pas négatif ; il s'en suit que la somme maxima que la compagnie puisse assurer est donnée par la formule :

$$\sigma = \frac{z}{q\,(1-q)}\ \frac{1}{\rho}\ \sqrt{2}.\ \sqrt{\Sigma s_k^2 q\,(1-q)}$$

où q est la probabilité du paiement et z le chargement pour l'unité relativement à la nouvelle assurance.

On voit que selon cette théorie la somme maxima est à peu près, enraison inverse de la probabilité du sinistre, mais en proportion di recte du chargement de risque.

Quand la grandeur $\mathrm{U} = \mathrm{G} + \Sigma s_k z_k - \rho \sqrt{2}\, \sqrt{b}$ est positif, il y a profit comme il est dit, quand au contraire U est négatif il y a perte, ou comme M. Schönwiese l'exprime il y a un *déficit idéal* ; quand le dernier cas se présente une assurance avantageuse diminue ce déficit idéal et

M. Schönwiese donne le conseil de ne pas aller au-delà de la somme maxima ; quand au contraire U est positif on pourrait aller un peu plus loin. Il me semble qu'il y a lieu de se demander si ce n'est pas dommage que la grandeur U n'entre pas dans la formule du plein.

M. Schönwiese fait l'observation qu'une nouvelle assurance est plus avantageuse à mesure que l'accroissement ΔU est plus grand. Il détermine la valeur maxima de ΔU et il trouve qu'elle correspond à une assurance au montant de la moitié du plein. Cela me semble bien intéressant.

Ensuite M. Schönwiese applique encore sa théorie pour déterminer en des cas particuliers, quel est le plus petit nombre d'assurances pour qu'une compagnie puisse opérer. Il trouve p.e. : quand toutes les sommes assurées sont égales, que la probabilité d'un sinistre est 0·02 tandis que le chargement de risque est 0·005, ce nombre minimum est 1,061.

Tout en montrant l'influence de sa théorie sur les diverses formes d'assurance, l'auteur fait ressortir que cette méthode doit subir des modifications, quand p.e. la compagnie sait faire valoir ses capitaux à un taux d'intérêt plus élevé que celui adopté dans le calcul des primes et de la réserve. D'ailleurs le plus souvent les compagnies ont fait choix de tables de mortalité donnant des primes, qui renferment déjà un chargement de risque, ce qui peut les dispenser de charger les primes dans ce but et ce qui leur permet d'assurer de plus grosses sommes que la théorie ne permettrait.

Je n'ai que peu de mots à ajouter. On voit que les auteurs s'accordent à déconseiller une application rigoureuse de leurs formules, ça ne dit pas que ces formules soient sans valeur en elles ; s'il y a parfois un conflit apparent entre la théorie et la pratique, ce n'est pas une raison pour dédaigner la théorie, ça dit plutôt que la théorie est encore incomplète. Et c'est ici le cas : nos formules ne savent pas encore tenir compte de toutes les causes qui peuvent justifier un plein plus grand ou petit, et nous n'avons pas encore su introduire les approximations désirables.

Nous ne pouvons donc que donner gain de cause à ceux qui s'abstiennent de formules et s'en tiennent à leur expérience qui leur a donné des règles. P.e. quand les compte-rendu montrent des profits qui vont en croissant et que la compagnie doit souvent avoir recours à la réassurance, parce qu'il se présente tant de candidats à des assurances élevées, il y a lieu d'augmenter le plein ; tandis que les pertes et le petit nombre de candidats aux grandes assurances peuvent être un avertissement à la prudence.

Mais la science marche, et marche vite ; elle finira par donner la réponse à plusieurs questions, et ceux parmi nous qui en vieillissant commencent à se sentir fatigués de leurs recherches, se réjouiront d'avoir de jeunes successeurs qui continueront leur belle tâche.

APPENDICE.

Lorsque mon article pour le Congrès de Londres était déjà imprimé, je reçus de M. le Dr. F. Hausdorff un exemplaire d'un traité intitulé: "Das Ritico bei Zufalls Spielen." M. Hansdorff introduit le risque relatif $\frac{M}{S}$, M étant le risque moyen total et S la totalité des sommes assurées. Pour un nouveau groupe d'assurés soit le risque moyen total M', la somme des capitaux S', alors le nouveau risque moyen total est $\sqrt{M^2+M'^2}$ et le nouveau risque relatif $\frac{\sqrt{M^2+M'^2}}{S+S'}$.

M. Hansdorff met la condition que le nouveau groupe n'augmente pas le risque relatif, ce qui donne:

$$\frac{M^2+M'^2}{(S+S')^2} < \frac{M^2}{S}.$$

On observera la grande ressemblance entre la méthode de M. H. et la mienne.

Encore ai-je à dire qu'il vient de paraître la dissertation inaugurale de M. le Dr. J. N. Peek, intitulée "Toepassing der Waar Schijnlijkheids. Rekening op Levensverzekering en Sterfte-Statistick" (Application du Calcul des Probabilités à l'assurance sur la vie et à la statistique mortuaire).

Dans le Calcul du plein M. Peek se sert de deux constantes arbitraire: le chargement de la nouvelle assurance et un coefficient de sûreté.

Discussion.

Mr. George King said that there was not of course time to go into the question of the various formulas which had been brought out by Mr. Landré in his paper; but he (the speaker) would like to refer to the close of the paper, where the author expressly said that while investigations, such as were brought forward, might be very useful, yet it is not possible to apply them rigorously. In that all would agree with him, because the data are not available to measure with mathematical precision the limits that a company should hold. That depends upon many considerations, and one of great importance is the bonus period. A company that makes its investigation every year cannot hold so much on one life, as another of the same size that makes its investigation say quinquennially. We must look at this question from a practical point of view, and the most practical point of view of all is the question of the divisible surplus. That is not a question of safety, because a company cannot be put in the least danger by any limit it is likely to hold. The limit should be so adjusted that two or three unfortunate claims in the bonus period would not seriously affect the amount of surplus divisible. It should be understood by the public that there is no question of safety, but merely the question of so arranging that there may be a tolerably uniform surplus for distribution. From that point of view the question becomes very simple, and it is impossible at the present time to apply any mathematical formula to it. It must be looked at merely from the point of view of convenience. How much can a company hold on one risk without endangering serious fluctuations in the bonus?

On the Calculation of Surrender-Value.

By S. de Savitch.

Upon the invitation of the Permanent Committee of Actuarial Congresses I propose to start the discussion at the present Congress in London of the question of computing a theoretic formula for the calculation of surrender-values of life policies.

In the following note I will try to explain summarily the motives of this proposition; for the sake of clearness I will only treat the whole-life insurance with annual premiums till death, but the same considerations are to be applied to many other cases.

The reserve net value of a life policy being destined to cover the future risks of the insurance company, it becomes free at the time of breaking the insurance contract.

Nevertheless, the surrender-value generally cannot be equal to the whole amount of the reserve-value of the policy; the expenses that the company is ordinarily obliged to pay out in contracting an insurance (namely, agents' commissions, physicians' fees, &c.), and a certain deterioration of vitality, which follows, as is well known, the lapsing of those policies by the most healthy lives, cause serious obstacles to such a calculation of surrender-value.

Hence the life policy conditions of all insurance companies and laws concerning the life insurance contracts always fix different restrictions on the policyholders' rights to the whole reserve-value of the lapsed contracts.

In the majority of cases the right to a surrender-value is admitted only after a certain duration of policy (namely, from two to five years); concerning the amount of this value the most usual regulations are presented in the following categories:

1. The assurance company is obliged to pay as the surrender-value a fixed part of the full value of the policy; this part depends not upon the duration of the contract, but on the amount of the reserve fund, and usually is settled as two-thirds or three-quarters of it (as received by many Russian and German companies).
2. The surrender-value determined in accordance with the rule of the previous paragraph sometimes is increased if the amount of the reserve itself is large enough comparatively to the sum assured (see Gotha and many other German companies).
3. The companies subtract from the reserve-value a fixed sum (ordinary one-and-a-half or two per-cent of the sum assured) and then pay the policyholders a part of the rest.

4. The company returns a part of the premiums paid to the policyholders without interest (one-third or one-fourth of premiums); such a rule is enacted by the civil codes of Italy and Hungary.
5. According to the nonforfeiture law of the State of Massachusetts, the companies are obliged to pay the policyholders, on ceasing their contract, the reserve value less 8 per-cent of costs of insurance.
6. Many companies print in their policies the amount of surrender-values without explaining the manner in which they are calculated.

The above conditions do not seem to be perfectly equitable and rational. The surrender-value perhaps would be less arbitrary if more attention was paid to the circumstances which prevent the companies from paying the amount of full reserve-value (expenses made by contracting insurance and selection) and to their influence over surrender-values, the more so as the approximate appreciation of these two elements does not seem quite impossible.

The sum to be subtracted from the full reserve in order to indemnify the extra expenses of the company may be calculated upon the supposition that the company liquidate these expenses annually in the space of the whole duration of the contract.

Let a be the amount of the expenses to be amortized, x and $x+n$ ages of contracting and leaving assurance, the sum sought for is evidently $a\frac{a_{x+n}}{a_x}$.

This sum can be found easily even in other suppositions about the manner of amortizing the first expenses, but it is without doubt a great deal more difficult to appreciate the influence of the withdrawal of the more healthy lives.

Let A and P be single and annual net premiums of an insurance and a the annuity, all calculated according to the table of mortality accepted by the company for the whole-life insurance; let also A′ and a' be the same numbers, but calculated, according to the table of which the company makes use, in pure endowments or annuities.

Together with the net reserve value of a policy

$$V = A - Pa$$

I will consider the quantity

$$V' = A' - Pa'$$

generally

$$V' < V,$$

and it is necessary to assume that the surrender-value, which I will represent by V_s, is enclosed between these two numbers; so

$$V_s = V' + \theta(V - V')$$

where θ is a fraction, which depends upon the relation of the numbers of policies lapsed, observed by the computing of the table of mortality for the whole-life insurance and at the present time (or expected in the early future). Let ϵ and η be fractions, showing the relation between the numbers of policies surrendered and in force at these two different periods.

As the first approximation, we can assume that

$$V_s = V - (V_s - V')(\eta - \epsilon), \text{ or } V_s = V' + \frac{1}{1+\eta-\epsilon}(V - V'), \text{ or } \theta = \frac{1}{1+\eta-\epsilon}$$

If now we represent by ${}^{(z)}V$ the quantity $V - a\frac{a_{x+n}}{a_x}$, the formula for calculating surrender-values will be

$$V_s = {}^{(z)}V' + \frac{1}{1+\eta-\epsilon}({}^{(z)}V - {}^{(z)}V') \quad . \quad . \quad (A)$$

The numbers a, ϵ and η cannot be given *a priori*; they will be different not only in different countries, but even in different companies. In the annexed tables the quantities V_s are calculated according to the formula (A) on the suppositions: (1) The quantity a is equal to 1, 5 per-cent. of the sum assured, and the difference $\eta - \epsilon$ is equal to $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$, or correspondingly $\theta = \frac{2}{3}$, $\frac{3}{4}$ and $\frac{4}{5}$; the rate of interest is 4 per-cent, and the sum assured is 1,000; (2) In the first table (I) is assumed that the company for whole-life insurance makes use of the table M_1 of twenty-three German insurance companies, and for endowment, of that of Dr. Semmler, published by Dr. Schmerler in the brochure *Die Sterblichkeits Erfahrungen unter Renten Versicherten*; in the second (II), Tables AF and RF, published by the committee of four French insurance companies.

The formula (A) does not give quite a sufficient solution of the question proposed, and I present the above considerations principally in order to produce a discussion of the question itself.

TABLE I.

Tables of Mortality { (*a*) M_1 *of 23 German Insurance Companies.* (*b*) *Of Dr. Semmler.*

x	n	$V_{x,n}$	${}^{(z)}V_{x,n}$	$V'_{x,n}$	${}^{(z)}V'_{x,n}$	V_s			
						$\theta=\frac{2}{3}$	$\theta=\frac{3}{4}$	$\theta=\frac{4}{5}$	$\frac{3}{4}V_{x,n}$
20	5	40·96	26·58	12·52	− 2·03	17·05	19·43	20·86	30·72
	10	88·94	75·27	46·96	32·92	61·15	64·68	66·80	66·71
	20	202·53	190·57	135·04	122·30	167·81	173·50	176·91	141·90
	30	339·97	330·07	261·22	250·34	303·49	310·14	314·12	254·98
30	5	58·96	45·40	− 1·07	− 15·43	25·13	30·20	33·24	44·20
	10	124·68	112·07	50·60	36·99	87·04	93·30	97·06	93·51
	20	275·54	264·10	189·10	177·48	235·23	242·45	246·78	206·66
	30	442·90	434·88	371·94	363·93	411·23	417·14	420·69	332·18
40	5	83·24	69·47	− 12·92	− 26·93	37·34	45·37	50·19	62·43
	10	173·62	161·21	73·60	60·79	127·74	136·10	141·12	130·23
	20	364·53	354·99	282·48	272·56	327·51	334·38	338·50	273·40
	30	552·70	545·98	498·34	491·40	527·79	532·33	535·06	414·53
50	5	115·10	101·83	− 0·99	− 14·40	63·09	72·77	78·58	86·33
	10	231·02	219·48	133·08	121·46	186·81	194·98	199·88	173·27
	20	458·72	450·41	393·87	385·75	418·86	434·24	437·48	344·09
60	5	150	137·25	45·75	33·05	102·52	111·20	116·41	112·05
	10	296·10	285·54	211·77	201·29	257·46	264·48	268·69	222·08

TABLE II.

Tables of Mortality—AF *and* RF.

x	n	$V_{x,n}$	${}^{(z)}V_{x,n}$	$V'_{x,n}$	${}^{(z)}V'_{x,n}$	V_s			
						$\theta=\frac{2}{3}$	$\theta=\frac{3}{4}$	$\theta=\frac{4}{5}$	$\frac{3}{4}V_{x,n}$
20	5	34·67	20·18	6·91	− 7·68	10·89	13·22	14·61	26
	10	79·50	65·67	45·42	31·39	54·24	57·10	58·81	59·73
	20	191·38	179·19	144·97	132·38	163·59	167·49	169·83	143·54
	30	332·26	322·15	277·28	266·59	303·63	308·26	311·04	249·20
30	5	56·56	42·39	12·72	− 1·58	27·73	31·40	33·60	42·42
	10	121·34	108·13	71·01	57·55	91·27	95·48	98·01	91
	20	274·14	263·17	214·50	203·07	243·14	248·15	251·15	205·61
	30	448·46	440·06	388·60	379·64	419·92	424·95	427·97	336·35
40	5	82·64	68·86	19·3	5·37	47·69	52·98	56·16	61·98
	10	173·44	160·99	105·75	93·02	138·33	143·99	147·39	130·08
	20	371·30	361·77	303·35	293·37	338·97	344·67	348·09	278·48
	30	568·97	562·34	513·74	506·69	543·79	548·43	551·21	426·73
50	5	117·03	103·75	33·39	19·96	75·82	82 80	86·99	87·77
	10	238·41	226·92	156·54	144·78	199·54	206·39	210·49	178·81
	20	476·59	468·60	410·04	401·74	446·31	451·88	455·22	357·44
60	5	158·52	145·85	59·24	46·45	112·72	121	125·97	118·89
	10	310·84	300·42	223·99	213·40	271·41	278·66	283·01	233·13

Note on the Mortality in the British Navy and Army. By James J. McLauchlan, F.F.A., *Secretary of the Scottish Equitable Life Assurance Society.*

I had the pleasure of submitting to the first Actuarial Congress, in 1895, a paper in which I expressed the hope that information might be communicated and recorded as to such of the official statistics published in the various countries represented at the Congress, as are calculated to throw light on subjects of interest to actuaries and insurance men. It occurs to me that it may be useful if I now communicate the following tables as examples. The construction of them is fully explained in my paper "On the Mortality in the British Navy and Army, as shown by the Official Reports", read before the Institute of Actuaries on 25 April last.

Tables Relating to the Navy.

Table I.—*Average Annual Death Rates per* 1,000 *in the Service Afloat.*

10 Years ending 31 December	From Disease	From Violence	From all Causes
1865	11·7	4·2	15·9
1875	6·8	3·5	10·3
1885	5·4	4·0	9·4
1895	4·4	2·6	7·0

Table II.—*Average Annual Death Rates per* 1,000 *in the Service Afloat, compared with the Rates to be expected according to Dr. Sprague's Select Life Tables.*

10 Years ending 31 December	Actual Death Rate	Expected Death Rate	Excess of Actual Death Rate
1865	15·9	4·8	11·1
1875	10·3	4·7	5·6
1885	9·4	4·8	4·6
1895	7·0	5·2	1·8

TABLE III.—*Deaths by violence in the Royal Navy in the* 10 *years* 1886–1895.

Falls from aloft	47
Wounds, Fractures, &c.	203
Wounds in action	37
Drowned	1,045
Suicide	63
Other causes	31
Total . .	1,426

NOTE.—The deaths by drowning include 80 lives lost by the wreck of the "Wasp" in 1887, 173 lives by the wreck of the "Serpent" in 1890, and 358 lives by the disaster to the "Victoria" in 1893.

TABLE IV.—*Average Strength, Deaths, and Invaliding on the various Stations in the* 10 *years* 1886–1895.

Station	Average Strength	Dead		Invalided	
		Total	From Injuries	Total	From Injuries
Home	27,546	1,663	431	6,360	463
Mediterranean	7,732	817	441	3,174	183
North America and West Indies .	2,670	137	57	636	50
South-East Coast of America .	579	35	22	123	12
Pacific	1,601	68	24	370	37
West Coast of Africa and Cape of Good Hope	2,290	184	59	835	90
East Indies	2,018	193	37	1,145	81
China	3,745	282	107	908	57
Australia	2,140	141	61	444	52
Irregular	5,309	390	171	919	101
Total Force	55,630	3,910	1,410	14,914	1,126

TABLE V.—*Death Rates and Invaliding Rates per* 1,000 *on the various Stations, in the* 10 *years* 1886–1895, *showing also the Death Rates and Invaliding Rates from causes other than Injuries.*

Station	Death Rate per 1,000		Invaliding Rate per 1,000	
	From all Causes	Excluding Injuries	From all Causes	Excluding Injuries
Home	6·0	4·5	23·1	21·4
Mediterranean	10·6	4·9	41·0	38·7
North America and West Indies .	5·1	3·0	23·8	21·9
South-East Coast of America . .	6·0	2·2	21·2	19·2
Pacific	4·2	2·7	23·1	20·8
West Coast of Africa and Cape of Good Hope	8·0	5·5	36·5	32·5
East Indies	9·6	7·7	56·7	52·7
China	7·5	4·7	24·2	22·7
Australia	6·6	3·7	20·7	18·3
Irregular	7·4	4·1	17·3	15·4
Total Force	7·0	4·5	26·8	24·8

Tables Relating to the Army.

Table VI.—*Strength and Mortality of the British Army.*

		1866–75	1876–85	1886–95
Average Strength	In United Kingdom	94,263	94,624	105,380
	Abroad	96,746	95,080	107,015
	Total Army	191,010	189,704	212,395
Total Deaths	In United Kingdom	9,970	7,696	5,746
	Abroad	16,334	17,026	14,220
	Total Army	26,304	24,722	19,966
Death Rate per 1,000	In United Kingdom	10·6	8·1	5·5
	Abroad	16·9	17·9	13·3
	Total Army	13·8	13·0	9·4

Table VII.—*Average Annual Death Rates per* 1,000 *in the Army, compared with the Rates to be expected according to Dr. Sprague's Select Life Tables.*

10 Years ending 31 December	Actual Death Rate	Expected Death Rate	Excess of Actual Rate (2)−(3)
(1)	(2)	(3)	(4)
1875	13·8	4·7	9·1
1885	13·0	5·2	7·8
1895	9·4	4·7	4·7

Table VIII.—*European Troops—Average strength, number died, and number discharged as invalids in the different commands, in the* 10 *years* 1886–1895, *with the corresponding Death Rates and Rates of Impairment.*

Command	Average Strength	Died	Discharged as Invalids	Death Rate per 1,000 (3) ÷ (2)	Rate of Impairment per 1,000 (4) ÷ (2)
(1)	(2)	(3)	(4)	(5)	(6)
United Kingdom	99,519	5,057	16,154	5·1	16·2
Gibraltar	4,683	211	400	4·5	8·5
Malta	6,907	515	756	7·5	10·9
Egypt and Cyprus	5,300	864	788	16·3	14·9
Canada	1,373	59	172	4·3	12·5
Bermuda	1,383	148	133	10·7	9·6
West Indies	1,159	107	157	9·2	13·5
South Africa and St. Helena	3,381	223	508	6·6	15·0
Mauritius	519	85	95	16·4	18·3
Ceylon	1,204	137	142	11·4	11·8
China and the Straits Settlements	2,543	241	281	9·5	11·0
India	67,324	10,451	8,814	15·5	13·1
On Board Ship	2,522	164	...	6·5	...
Total	197,817	18,262	28,400	9·2	14·4

Note.—The death rates and rates of impairment given in these tables are central rates.

The Rates of Mortality in Australia and New Zealand.

By D. Carment, F.I.A., F.F.A.

Introduction.

The purpose of the present paper is to bring together some statistics bearing on the past and present rates of mortality, as well as some of the diseases which prove most fatal in the Australasian Colonies, and particularly in New South Wales where the writer has resided for the last quarter of a century.

A few general remarks on the climate and physical characteristics of these colonies may not be out of place as an introduction. The Australian climate, as a whole, seems to be wonderfully well suited to the English race, if we may judge from the very favourable rates of mortality which have been found to prevail among the general population, and more especially among assured lives. It might, perhaps, at first sight, be imagined that the extreme heat often experienced during the long summer in many parts of the continent would be extremely prejudicial to longevity, but against this must be set the fact that this heat, where greatest, is generally accompanied by great dryness of the atmosphere, thus rendering its effects less injurious than might otherwise be the case. Further, the extraordinarily light mortality experienced in the country districts, as compared with the metropolitan areas, has undoubtedly a large influence in keeping down the average rate, and even in the various capitals themselves there is enormously more breathing space than in cities of the old world containing equal populations. Land in this new country is abundant, and there is as yet no necessity for building tenements 20 stories in height. In fact the suburban portions of our cities contain very few houses of more than two stories in height, while the great majority are of only one. Moreover, large areas of unoccupied land still exist, even within the boundaries of our suburban municipalities. Again, the nature of the climate and the circumstances and surroundings of the majority of the people are such that a much larger portion of their lives is spent in the open air, and in health-giving recreations, than can possibly be the case in the older countries of the world, and this, it seems to me, is probably another factor in determining the comparatively low rates of mortality experienced in a climate which, after all, is not that to which the English race is naturally indigenous. The wonderful adaptability of the human constitution to very various conditions is, in fact, strikingly shown by the very low rates of mortality prevailing in Australia, a large part of which lies within the

tropics, nearly all of it being subject to a much higher temperature than prevails in Great Britain. The city of Sydney, the capital of New South Wales, possesses, with its suburbs, a population of 410,000 (equal to over 30 per-cent of the population of the whole colony) and is situated in latitude 34° south. Its climate is thus of a sub-tropical nature, but its close proximity to the ocean has the effect of causing the temperature to be much more uniform than that of most portions of the interior.

To quote one or two statistics in regard to this point from Coghlan's *Wealth and Progress of New South Wales*—"As regards Sydney, "situated, as it is, midway between the extreme points of the colony, "in latitude 33° 51′ south, the same truth is apparent. Its mean "temperature is 62·9°, and corresponds with that of Barcelona, the "great maritime city of Spain, and of Toulon, in France, the former "being in latitude 41° 22′, and the latter in 43° 7′ north. At Sydney "the mean summer temperature is slightly under 71°, and that of winter "54°. The range is thus 17° Fahrenheit, while the mean yearly "average for a period of 38 years was 63°. At Naples, where the "mean temperature for the year is about the same as at Sydney, the "summer temperature reaches a mean of 74·4°, and the mean of "winter is 47·6°, with a range of 27°. Thus the summer is warmer "and the winter much colder than at Sydney. The greatest "temperature in the shade ever experienced in Sydney was in 1896, "when 108·5° in the shade was registered; and the lowest in winter was "35·9°, giving a range of 72·6°. At Naples the range has been as "great as 81°, the winter minimum falling sometimes below the "freezing point.

"Taking the coast generally, the difference between the mean "summer and mean winter temperatures may be set down as averaging "not more than 24°—a range so small as to be but rarely found "elsewhere. The famed resorts on the Mediterranean sea-board bear "no comparison with the Pacific slope of New South Wales, either for "natural salubrity, or for the comparative mildness of the summer and "winter, while the epidemics and pestilences which have devastated "those regions of ancient civilization have never made their appear-"ance on these shores."

On the elevated table-lands situated some distance inland, and having elevations ranging from 2,000 to 4,500 feet, an entirely different set of climatic conditions is, of course, encountered, the winters being considerably more severe, while the temperature in summer ranges often higher than in the coastal regions. Yet these districts leave nothing to be desired in point of salubrity, and the climate of the New England table-land in particular, situated in the north of the colony, is as nearly perfect as can be found in any part of the globe; the range of thermometer, according to Mr. Coghlan's work already cited, approximating closely to that of the famous health resorts in the south of France. Passing to the great plains of the interior, situated on the further side of the mountain ranges which run within a comparatively short distance of the coast line, we find once more a widely different climate from those already described. Here the rainfall is in general extremely slight, and the leading characteristic of the climate is its extreme dryness. This circumstance, in fact, seems to conduce towards the salubrity of the region in question, and to

counteract the effects of the excessive heat often experienced in summer, when the thermometer frequently records a temperature from 10 to 20 degrees in excess of that ruling at the same time in the coastal districts. Much might of course be written regarding the various climatic characteristics of different portions of the colony, but to the actuary the subject of most interest is, no doubt, that of the rate of mortality which prevails in Australia, as compared with that in England and other countries situated in the temperate zones.

New South Wales, 1856-1866.

So far as I am aware, the first attempt at scientifically determining the rates of mortality in New South Wales was made in 1867, in a paper read by the late Professor Pell before the Royal Society of New South Wales, and published in their transactions. The calculations therein contained were based upon the returns of deaths for the years 1856 to 1866 inclusive, the former year being that in which the compulsory registration of births was inaugurated. At that time quinquennial censuses were taken, and the numbers of the living, as recorded in 1856 and 1861, also formed part of the basis of the calculations. In the paper referred to, the exact details of the method employed in arriving at the final results are not fully explained. The rates of mortality for Males and Females separately, as well as for "Persons", are given in the Tables appended to the paper for each age from 0 to 4 inclusive, and then for quinquennial ages as far as "80 and upwards." Columns d_x and $\mathring{e}_x$ for "Persons" are also given, and the various results are compared with the corresponding functions according to Farr's English Life Table, No. 3. In comparing the rates for Males and Females respectively with each other, it is at once apparent that the latter are subject throughout the whole of life to a less rate of mortality than the former. As will be afterwards seen, this circumstance seems to be mainly, if not entirely, due to the very great prevalence of accidental deaths in the colony, and the greater amount of exposure to such causes in the case of males.

It is also noticeable that the infantile mortality rate is extremely favourable when compared with Farr's Table, the number of deaths under five years of age out of 10,000 births being 1,892 according to Pell's Table, against 2,632 according to Farr's. The expectations of life by the two tables compare thus:

Age	Pell	Farr ("No. 3. Persons")
0	45·58	40·86
1	49·91	46·98
2	51·41	49·12
3	51·50	49·91
4	51·32	50·13
5	50·90	50·01
10	47·11	47·37
15	42·81	43·53
20	38·59	39·87
30	31·25	33·28
40	24·07	26·70
50	17·77	20·14
60	12·00	13·94
70	7·41	8·74
80	3·58	5·11

It would thus appear that although the infantile mortality comes out so favourably in this comparison, yet at adult ages the difference is in favour of the English Table.

New South Wales, 1860–1875.

In the year 1877, or thereabouts, Professor Pell made another determination of the mortality of the colony, and published the results in a series of articles communicated to the *Sydney Morning Herald*, and afterwards issued in pamphlet form. On this occasion he used the Registrar-General's returns of deaths for the years 1860–75 inclusive, the reason for beginning at that point being that the separation of Queensland from the mother colony took place during the year 1859, and thus the new statistics embraced only that portion of territory which is still comprised in New South Wales. The results of these calculations, which were presumably more trustworthy than those based on the earlier statistics, were still more favourable to infant life, the number of deaths under age five being 1,765 as against 1,892. It is further pointed out, however, that this superiority attaches entirely to the country districts, and not to the metropolis itself, or more especially to the city proper, the number of deaths under five years of age out of 10,000 births being in the city 3,001, and in the city and suburbs 2,741, against 1,403 in the country districts. Such very wide discrepancies are somewhat hard to explain, but are no doubt mainly due to the imperfect sanitation of the metropolis during the period in question, as well as to the fact that outside of Sydney there are no towns of any great size, the population being for the most part sparsely distributed over a vast territory. It is also pointed out in this pamphlet that the infantile mortality of the colony as a whole is almost on a par with that shown in Farr's Healthy Districts Table, while if Sydney and its suburbs be excluded, the result is 20 per-cent more favourable than that shown in the last-mentioned table. At adult ages, however, as in the earlier table, the advantage shown in infancy seems largely to disappear, the rates of mortality in quinquennial groups of ages above 45 being, with one slight exception, higher than by the English Life Table, No. 3, but decidedly lower than those shown by the former table for New South Wales. Taken all round, the new rates show a decided improvement upon those for the former period, and the Professor hazards the opinion that this is probably due to the increasing proportion of the Australian-born element in the population. The greater mortality of males as compared with females throughout the table, except at ages 2 and 3, is again a striking feature of these observations, and is clearly shown to be due to the much greater prevalence of accidental deaths in Australia when compared with England. The results contained in the pamphlet to which I have been referring were subsequently communicated to the Institute of Actuaries, in a paper which was read there on 6 January 1879, and published in the *Journal* (Vol. 21, p. 257). In this article the whole of the data are given, as well as a full description of the manner in which they were treated, and the appended tables, besides giving l_x, d_x, and q_x, contain also Commutation Columns and Values of Annuities and Assurances at 4 per-cent interest. In this paper there are also given the rates of mortality in quinquennial groups of

ages, as derived from the deaths during the years 1869 to 1875 for the purpose of showing the progressive improvement between the three sets of observations 1856–1866, 1860–1875, and 1869–1875. According to these figures there is a general and progressive improvement at nearly every age. In searching for the probable cause of this improvement, the author again suggests that this is most likely due to the fact of the larger proportion of those of Australian birth, although prior to the publication of these statistics it seems to have been considered that the Australian climate conduced to the production of a race of *less* vitality than their progenitors. One would naturally suppose, however, that, other things being equal, the natives of any particular country would be more suited to its climate than immigrants from countries possessing widely different climatic conditions. But after all the matter is one which can only be settled, if at all, by the study of suitable statistics; and it is not unlikely that several generations must yet elapse before much light can be thrown on the question of whether or not the vitality and longevity of the British race are increased by its transplantation to Australian soil.

New Zealand, 1873.

In November 1875, a valuable paper was read by Mr. James Meikle before the Actuarial Society of Edinburgh (see *J.I.A.*, Vol. 19, p. 291), entitled "On the additional premium required for residence in foreign climates", in which he treats, among other topics, of the rate of mortality in New Zealand, and shows how exceptionally light it is when compared with other parts of the globe. The death rate of the population for the years 1864 to 1874 inclusive, varied from 17·30 down to 10·13 per 1,000, averaging for these years about 12·5 per 1,000—a remarkably low rate, even when ample allowance is made for a distribution of the population according to age which no doubt differs considerably from that of England. Mr. Meikle deduced, from the deaths in the single year 1873 and the population as enumerated at March 1874, the rates of mortality in quinquennial age-groups. These rates show, as compared with either the Carlisle or the H^M Table, an astonishingly light rate of mortality throughout the whole of life, more especially at the infantile ages; and the suggestion is made by the author that possibly "the climate of England may not be that in "which its natives can best preserve their health and lengthen their "lives."

New Zealand, 1874, 1878, 1881.

In 1883, a paper was read before the Wellington (N.Z) Philosophical Society by Dr. A. H. Newman and Mr. F. W. Frankland on the Healthiness of New Zealand (printed in abstract, *J.I.A.*, Vol. 24, p. 211), in which some very interesting statistics are given as to the rates of mortality in that colony, derived from the three censuses of 1874, 1878, and 1881, together with the deaths which took place in these three years. The mean death-rate for all ages during the years in question was extremely low, being at the rate of only 11·63 per 1,000, and, when arranged in quinquennial age-groups, shows a rate of mortality even more favourable than that brought out by Mr. Meikle

in his paper just cited. In this paper, Mr. Frankland very ably discusses the various causes which conduce towards this result, and shows that it is by no means due to climate alone, but partly also to various other causes, some of which will no doubt be only temporary in their operation, *e.g.*, the selection by the Government of healthy middle-aged individuals in Great Britain who are granted free passages to the colony, the large proportion of adult males existing in the population, the abundance and consequent cheapness of wholesome food, the sparsity of population, &c.

New Zealand, 1880–1892.

Another, and more recent, determination of New Zealand mortality was made by Mr. Geo. Leslie, Assistant Actuary to the New Zealand Government Life Insurance Department, the results of which appeared in the form of an elaborate paper in the *New Zealand Journal of Insurance, Mining, and Finance*, in September and November, 1895, being also published since in pamphlet form. The data used were the deaths for the 13 years 1880–1892 inclusive, and the numbers living at the three censuses of 1881, 1886, and 1891. The annual average death rates during the period were extremely light, being for males 11·22 per 1,000, and for females 9·46. The resulting rates of mortality are wonderfully low at almost every point, the rates for the age-group 0–4 being very much lower than that shown by Farr's "Healthy Districts" Table, though somewhat higher than the "Peerage" Table. At ages 5–9 the rate for males is only half of that by the Healthy Districts Table, and is somewhat less than the Peerage rate. For females at the same ages the results are even more favourable, and a considerable advantage continues to prevail at almost all the adult ages for both sexes. As regards the relative mortality of the sexes, it was found that the rate for females was more favourable than for males at every group of ages except one, namely, 25–34. For ages over 75, the data being somewhat scanty, the tables were completed by joining on the probabilities acccording to the Healthy Districts Table, as there was a fairly close resemblance between the probabilities by that table and those which had been deduced for the colony. It is claimed, with apparent reason, that the figures brought out prove New Zealand to be the healthiest country in the world.

Victoria, 1871.

To return now to Australia proper, I find that a few years after the date of Professor Pell's paper, already referred to, another interesting paper, bearing on the subject of Australian mortality, was read before the Institute (*J.I.A.* xxiii, p. 309). Its author was Mr. A. F. Burridge, F.I.A., and its subject was the rates of mortality in the colony of Victoria. The calculations in this paper were based upon the ages of the population as recorded at the census of 1871, and the deaths during the same year. In view, however, of the very considerable variations in the death-rate from year to year, it can hardly be considered that any table based on only one year's deaths is quite satisfactory. Mr. Burridge himself, in fact, remarks on these fluctuations in the paper

under consideration, and seems to be at a loss to satisfactorily account for some of them. For instance, in the year 1875, there was, not in Victoria alone, but in most of the other colonies as well, an extraordinarily heavy rate of mortality. Mr. Burridge says regarding this—"So far as I have been able to find, the only explanation which has "been offered of these fluctuations is that, in 1875, and, to a certain "extent, in the preceding and succeeding year, the death-rate was "swelled by epidemics of measles and scarlatina; but it must be felt "that these causes are totally inadequate to produce such astonishing "results, and attention is now drawn to them in the hope that some "light may be thrown on the subject." An examination of the Registrar's returns for the years in question, however, will at once show that the fact of the occurrence of these epidemics, which mostly affected young children in the metropolitan cities of the several colonies, was amply sufficient to account for the abnormal increase in the ratios. Thus I find that in New South Wales the numbers of deaths from measles and scarlatina were in 1875, 1,054; and in 1876, 1,132; while the number for the following year was only 96.

New South Wales, Victoria, Queensland, and South Australia, 1870–1881.

In 1884, Mr. Burridge contributed to the Institute a further paper "On the Rates of Mortality in Australia" (*J.I.A.* xxiv, p. 333), in which he takes wider ground than in his previous one, and deals with the deaths for 1870–1881 inclusive in the four principal Australian colonies, New South Wales, Victoria, Queensland, and South Australia. In this paper he gives the death-rates for quinquennial age-groups in each of the colonies named, as deduced from the deaths for the years stated, and the censuses of 1871 and 1881. As, however, in the case of South Australia, all the deaths from age 50 upwards were grouped together in the returns, it was decided to omit the statistics of that colony from the final tables, which, therefore, refer only to New South Wales, Victoria, and Queensland, the combined population of which, he states, amounts to 85 per-cent of the whole. As regards ages under five, Mr. Burridge shows that the probabilities of surviving a year at each age are extremely favourable, and are greater than those according to Humphreys' English Table (1876–1880). It is further shown that at nearly all ages throughout life the Australian experience is more favourable than the English rates for the years just mentioned. In concluding his paper, Mr. Burridge calls attention to several of the causes which combine in producing this low rate of mortality, these being in the main similar to those already cited from Mr. Frankland's paper on the mortality of New Zealand.

New South Wales, Victoria, Queensland, New Zealand, and Tasmania.

A valuable and interesting paper on mortality, as affecting Life Assurance in Australia, was also read at the Insurance Institute of Victoria, on 10 July 1889, by Mr. T. W. Bremner, F.F.A., and published

in the volume of *The Australasian Insurance and Banking Record* for that year. In this paper, Mr. Bremner has confined himself to the ages between 15 and 70, and has calculated a series of mortality tables beginning with a radix of 10,000 at the earlier of these ages. The data, as regards the deaths in the case of the several colonies, however, are not all for the same years. In the case of New South Wales, they are taken for the years 1870–81, while for Victoria two separate sets of data have been made use of, thus giving rise to two different columns of l_x, the two periods being 1861–80 and 1881–87. For Queensland, the years taken were 1870–81, for Tasmania 1876–85, and for New Zealand 1880–82. South Australia and Western Australia have been entirely omitted, presumably for the same reasons as in Mr. Burridge's investigation. An l_x column for the whole of Australasia is given, in addition to those for the separate colonies, this being formed by combining the numbers living according to the experience of each colony in the approximate proportions of the population of each to the sum of the whole. The results show that the rates of mortality in New South Wales and Victoria run very closely together throughout, while Queensland shows a considerably heavier rate, and New Zealand a very much lighter, the Tasmanian table running very close to the last mentioned, but showing on the whole a slightly heavier mortality. Mr. Bremner further points out that the Victorian mortality for the years 1881–87 shows a decided increase over that experienced in the period 1861–80, and he seemed inclined to think that this increase would probably prove permanent.

In July 1888, a paper was also read to the Insurance Institute of Victoria, by Mr. T. S. Robertson, entitled "Gleanings from the Vital Statistics of Victoria", in which he dealt with the birth and death rates in that colony during the year 1886, as disclosed by the Registrar-General's report. He also compared the rates of death from several classes of disease with the corresponding rates in England. This paper will be found in the volume of *The Australasian Insurance and Banking Record* for the year in question.

New South Wales, 1890–1892.

The next determination of Australian mortality, so far as I am aware, was that relating to the mortality of New South Wales as determined from the census of April 1891, together with the recorded deaths for twelve months before and twelve months after that date. The results are to be found in the 1892 edition of the "Wealth and Progress of New South Wales," by T. A. Coghlan, Government Statistician. The population, excluding roving Aborigines, numbered 1,123,954, and the deaths between 1 April 1890, and 31 March 1892, numbered 30,834, being at the rate of 15,417 per annum, which gives 13·72 as the average rate of mortality during the period covered by the investigation—a rate which, in spite of the influence of the influenza epidemic in 1891, is considerably *less* than the mean rate actually experienced over a series of years. For this reason I can hardly regard this table as being a very trustworthy exponent of the true rates of mortality prevailing in the colony. What we desire to know is not the rate at any particular instant, but, approximately at least, the rate likely to be experienced over a considerable period. It is

true that in such a country as Australia this rate is much more difficult to determine with any degree of exactness than in the countries of Europe, but still some approach to what is required, may, it seems to me, be obtained by taking account of the deaths over a period of ten or twelve years.

According to Mr. Coghlan's table the probabilities of living are greater for females than for males at all ages over 7, and the expectations of life compare very favourably with those shown by the English Life Table (1876-80). In the "General Report on the eleventh Census of New South Wales" it is pointed out that 70 per-cent of the population in 1891 were Australian-born, while only 30 per-cent were born elsewhere. It is further noted that of those over 16 years of age about one-half belong to the latter category, and the Report goes on to say that there are a very large number of persons in the Colony whose past life has been very little influenced by Australian conditions. "The earlier ages are practically purely "Australian whilst the later ages are partly Australian and partly "British and foreign, the latter element getting stronger as the "ages advance. Therefore, though the expectation here given is "correct as regards the population as at present constituted, it might "not be so if the Australian-born element predominated as largely "at every age as it does at the earlier periods." There appears, as a matter of fact, to be no doubt that the purely Australian death-rate is less than the English at the infantile ages, but for the later ages the data at our command appear to be insufficient to settle the question with certainty.

New South Wales and Victoria 1881–1891.

In June 1893, a further contribution to the literature of the subject was made by Mr. W. R. Dovey, F.F.A., who read, at the Insurance Institute of New South Wales, a paper on "The Rate of Mortality in New South Wales and Victoria", in which he took as the basis of the calculations the population at the censuses of 1881 and 1891, and the deaths for the eleven years 1881–1891 inclusive. Mr. Dovey expresses the opinion that in all probability the future death-rates of these colonies will be permanently more favourable than those of the old country, adducing much the same reasons as have already been cited. In obtaining the rates of infantile mortality, Mr. Dovey adopted the method laid down by Professor Pell (*J.I.A.* xxi, 262), and states that no allowance has been made for the emigration or immigration of infants, as correct returns on the subject are not available. "Hence the population may be somewhat understated, and the rates of mortality appear slightly in excess of the reality." The following table gives the probabilities of living a year for males and females respectively at ages 0—4 inclusive, by various tables, Mr. Dovey's figures for New South Wales and Victoria being in the last column :

Ages	New South Wales 1860-75	New South Wales, Victoria, and Queensland 1870-81	New South Wales 1890-92	New South Wales and Victoria 1881-91
		MALES.		
0	·8892	·8746	·8723	·8672
1	·9548	·9554	·9720	·9649
2	·9813	·9800	·9874	·9868
3	·9882	·9854	·9920	·9907
4	·9913	·9886	·9935	·9927
		FEMALES.		
0	·9039	·8912	·8888	·8832
1	·9558	·9578	·9721	·9657
2	·9814	·9815	·9894	·9877
3	·9881	·9864	·9928	·9913
4	·9920	·9899	·9955	·9930

It will be seen that the latest statistics show a somewhat heavier mortality at age 0, but that at the older ages there is an improvement. For ages 5 to 70, Mr. Dovey followed as nearly as possible the plan adopted by Mr. Milne in constructing the Carlisle Table, constructing by a graphical process two independent curves representing respectively the adjusted population and the adjusted deaths at each age, the central death-rate (m_x) being then obtained by dividing the one set of numbers by the other. The resulting probabilities of life are, with very few exceptions, higher than Mr. Burridge's, thus "showing "a gratifying improvement in the colonial mortality." In this table, as in all the previous ones already referred to, female life appears to be better than male at all ages, and the excess of mortality among the latter sex is traced to the two main causes of violent deaths and intemperance. For ages above 70, as the colonial data were hardly sufficient, the functions p_x were taken from the English Life Table, No. 3, taking, however, the probabilities for one year younger in the case of females. A comparison of the expectations of life by Mr. Dovey's table and by the English table just mentioned, is given below.

Expectation of Life.

Age	MALES		FEMALES	
	New South Wales and Victoria 1881–1891	English Life Table No. 3.	New South Wales and Victoria 1881–1891	English Life Table No. 3.
0	47·79	39·91	50·71	41·85
5	53·61	49·71	55·92	50·33
10	49·61	47·05	51·88	47·67
15	45·21	43·18	47·46	43·90
20	41·05	39·48	43·31	40·29
30	33·49	32·76	35·81	33·81
40	26·21	26·06	28·70	27·34
50	19·43	19·54	21·80	20·75
60	13·44	13·53	15·12	14·34
70	8·46	8·45	9·49	9·02

The general result of this investigation is that a decided improvement is shown in the rates of mortality of the colonies as compared

with earlier statistics, and also a vitality superior to the latest English data.

New South Wales and Victoria; also Sydney and Melbourne, 1881–1890.

Still another determination of the rates of mortality in these two colonies was made a year later by Mr. A. Duckworth, of the Australian Mutual Provident Society, and the results communicated to the Insurance Institute of New South Wales in a paper read on 11 July 1894. In this paper, the calculations for which were commenced before those of Mr. Dovey, the deaths were limited to the ten years 1881–90, the population used being the mean of the two censuses of 1881 and 1891. At the same time, another table was formed dealing with the rates of mortality in the two metropolitan cities of Sydney and Melbourne (including their suburbs), in addition to the table showing the mortality among the entire population of New South Wales and Victoria.

In making the calculations, the rates of increase of the population in each quinquennial age-group between the censuses of 1881 and 1891 were first determined, and thus the estimated population for each group in the middle of each calendar year during the period under observation was derived. Hence there was found the mean population at each age-group for the decennium, and this divided into the mean annual deaths at the same group of ages gave the mean annual rate of mortality for the central age of the group. These calculations were made separately for males and females respectively in each of the two colonies, and the results were graduated by the aid of the graphic method. For ages over 80, as the data were comparatively few and irregular, a comparison was made with Farr's English Table No. 3, and the average Australian rate for these ages being found to exceed the English rate by $2\frac{3}{4}$ per-cent, the table was completed by the addition of that percentage to the English probabilities.

The resulting combined table runs, as was to be expected, extremely close to that of Mr. Dovey, the maximum difference in the expectation of life not exceeding one-third of a year. The separate tables for the two colonies show a somewhat higher rate of mortality for Victoria as compared with New South Wales; and the table for Melbourne and suburbs also shows a distinctly heavier rate than that for Sydney and suburbs. This superiority on the part of Sydney is, no doubt, mainly due to the fact that this city now possesses a thorough system of sewerage as well as an abundant water supply, and as a natural result the death-rates from zymotic diseases has been comparatively light for some years part. As illustrating the extent of the difference between the two cities, it may be stated that by the table for Melbourne and suburbs the expectation of life at birth is given as 40·86, while by the corresponding table for Sydney it is as high as 43·39, and a difference in the same direction exists throughout the whole of the table.

Sydney and Suburbs, 1871–1885.

As bearing on this question of the mortality of Sydney and suburbs, it may here be further mentioned that in 1886, a paper on

this subject was read by Mr. Richard Teece, at the Insurance Institute of New South Wales. The data made use of were the deaths for the years 1871–1885 inclusive, and the results of the investigation as regards the infantile mortality (*i.e.*, at ages under five), was to show that though the average rate in the suburbs for the 15 years was somewhat less than in the city, yet it had been in the later years of the period increasing very rapidly, thus showing that the march of improved sanitation in the suburban areas had hardly kept pace with that in the city. For ages over five, the rate had during the last five years of the period averaged slightly less in the city than during the earlier years, though in the suburbs there was an increase.

Sydney and Suburbs, 1881–1896.

In April 1897, at the same Institute, Mr. Teece again referred to the subject of the comparative rates of mortality in the city and suburbs as regards persons under and over five years of age respectively, taking as data the deaths in the 16 years 1881–1896 inclusive, and dividing these into the three periods 1881–1885, 1886–1890, and 1891–1896. The results, as regards infantile mortality, are of an extremely gratifying nature, showing, as they do, that there has been a continuous decrease in the rate both in the city and suburbs, the suburban rate being also considerably lower throughout than that for the city. As regards ages over five, the improvement has not been quite so consistent throughout, at least in the city itself. The rates are shown below:

Mortality per 1,000 *of Population in Middle of Year.*

Average Rates	City of Sydney		Suburbs	
	Under Five Years	Five Years and Upwards	Under Five Years	Five Years and Upwards
1881 to 1885	84·31	14·38	74·15	10·93
1886 to 1890	70·40	11·33	57·31	10·78
1891 to 1896	60·11	12·44	41·81	8·38

It may here be mentioned, as throwing some light on the conditions of the metropolitan population, that the city proper contained, according to the latest estimate, a population of about 95,000, this number having of late years somewhat decreased. The suburbs consist of some 40 separate municipalities, many of which are of considerable territorial extent, some of them being distant 10 or 12 miles from the centre of the city, and contain an estimated population of about 315,000.

Mortality of Assured Lives.

Reference must also be made to the question of the mortality of Australasian assured lives. So far as I am aware, the only published experience on this subject is that of the Australian Mutual Provident Society, which has twice given to the world the results of its extensive operations. The first set of observations extended from its foundation in

1849 to the end of 1878, a period of 30 years, and was compiled by its then Actuary, the late M. A. Black, F.I.A. The second publication was brought to the end of 1888, thus embracing the first 40 years of the Society's history, and the investigation was conducted by Mr. Richard Teece, F.I.A., the Society's present General Manager and Actuary. It is not intended here to give any detailed account of the results brought out in these publications, but it may be shortly stated that, as regards lives accepted select during the first 30 years of the Society's history, the actual deaths were just two-thirds of the number expected according to the H^M Table of Mortality. As, however, the average duration of the whole of the assurances under review was only five years, this favourable result was, no doubt, to some extent, due to the selection of the lives. At the next investigation, ten years later, the average duration of the assurances had increased to 6·2 years, while the percentage of actual to expected deaths among select lives had actually fallen to 65 per-cent of the H^M rate. This Society is now preparing to investigate its experience for the first 50 years, which expire at the end of 1898, and the results will, no doubt, be awaited with much interest.

An interesting point in connection with this subject arises when we consider on what mortality basis the liabilities of Australian life assurance offices should be calculated. Hitherto, for want of any more reliable data, the H^M Table has been generally employed, but, seeing that the conditions of life and the general rates of mortality in these colonies differ so widely from those experienced in the mother country, it becomes a question whether it is proper and safe to use a mortality table framed entirely on the experience of British lives. With the view of throwing some possible light on this point, I have calculated some values of policies according to the Australian Mutual Provident Society's 40 years' experience, and also according to the table showing the mortality of New South Wales and Victoria from 1881–1891, and the results are shown below, in juxtaposition with the H^M values:

AGE AT ENTRY—20

Duration	H^M	Australian Mutual Provident Experience	New South Wales and Victoria, 1881–1891
5	3·477	3·493	3·960
10	7·702	7·622	8·082
15	12·457	12·223	12·890
20	17·864	17·377	18·289
25	24·147	23·083	24·298
30	31·093	29·427	30·954
35	38·695	36·632	38·107
40	46·757	44·757	45·581

AGE AT ENTRY—30

Duration	H^M	Australian Mutual Provident Experience	New South Wales and Victoria, 1881–1891
5	5·152	4·959	5·230
10	11·010	10·560	11·104
15	17·817	16·737	17·641
20	25·343	23·604	24·883
25	33·580	31·404	32 665
30	42·314	40·200	40·796
35	51·076	49·484	49·528
40	59·776	57·767	57·442

AGE AT ENTRY—40

Duration	H^M	Australian Mutual Provident Experience	New South Wales and Victoria, 1881–1891
5	7·649	6·906	7·353
10	16·106	14·584	15·499
15	25·362	23·304	24·254
20	35·177	33·139	33·401
25	45·023	43·519	43·223
30	54·799	52·781	52·126
35	63·851	62·859	61·142
40	71·463	73·760	68·207

It will be observed that the values by the Australian Mutual Provident experience are in almost every case somewhat less than those derived from the H^M Table. The values deduced from the table for New South Wales and Victoria are for the most part greater than those by the Australian Mutual Provident Table, but are still on the whole less than the H^M values, particularly for the older ages at entry. It must be recollected, however, that the data at the older ages, both in the statistics of the colonies themselves and especially in the experience of the life offices, are as yet insufficient, and therefore we may have to await the publication of the experience of the leading society for its first fifty, or perhaps its first sixty years, before we can hope to possess a trustworthy index of the probable mortality among assured lives for the next generation.

Causes of Death in New South Wales.

This paper has already grown to such a length that I have left myself little space to refer to any of the diseases which prove most commonly fatal among the population of this colony. A few brief remarks regarding some of them may, however, be made before concluding. The first notable point in my mind in this connection is the fact of the absence of two of the greatest scourges of the old world, cholera and small-pox. It is true that the latter has from time to time come to these shores, but it has on each occasion been promptly stamped out by vigorous action on the part of the Health Authorities, and has never caused more than a very few deaths. Such immunity, however, cannot be expected to last for ever, and I much fear that in this respect many amongst us are living in a fool's paradise, and that if it ever does gain a complete footing the death rate will be increased to an extent at present undreamt of. It must be recollected that although in Victoria and some of the other colonies vaccination is compulsory, yet in New South Wales it is entirely optional, and consequently the great majority of the population is unvaccinated.

As regards *Consumption*, it is well known that Australia is regarded as a sanatorium for patients suffering from this disease, and there appears to be no doubt that the death rate here from this cause is considerably less than in England. Of course, many are sent here by their friends or medical advisers in the very last stages of the disease, and in many cases also an entirely unsuitable climate may be chosen for the patient's residence, so that probably little or no good may result. But, leaving these points for the medical profession to discuss, the

general death rate of New South Wales from consumption may here be stated. I find that, during the five years 1892–1896 inclusive, 5,172 persons are recorded as dying from this disease, being at the rate of 83·67 per 100,000 of mean population per annum. The corresponding rate for England and Wales was 163·54 during the years 1886–1890, which are the latest statistics I have been able to find. Considerable discussion has recently taken place in the Sydney Press as to whether consumption is more fatal among natives of Australia or among those born elsewhere, but the published statistics in their present form hardly admit of the problem being solved with any degree of certainty.

Turning now to *Cancer*, as one of the diseases ranking high in the order of fatality, it may be noted that here as well as in England it has been of late years increasing in frequency. Taking the same five years as before, I find the death-rate from this cause has been 43·54 per 100,000, as against 63·16 in England during the years cited above.

Typhoid Fever, as might perhaps be expected, is somewhat more fatal in the colony than in the mother country, the rate being 27·07 in New South Wales as against 19·58 in England.

Deaths from *Accident and Negligence* are also on a much more extensive scale than in the old country, and are in great part due to the peculiar circumstances of a sparsely settled population in a comparatively new territory. The rate for the years in question was 76·22 against 54·38 in England. The mortality from these causes among males is approximately three times as heavy as among females, and this circumstance is by itself sufficient to account, as already hinted at in an earlier portion of this paper, for the fact that the probabilities of life for males are throughout the table less than those for females, in spite of the higher mortality which seems to prevail in the colony from *Childbirth and Puerperal Fever*. From these causes the deaths during the five years numbered one to every 167 births registered. I have not at hand the latest English statistics on the point, but believe that one in 200 is not far from the truth.

Conclusion.

I have now endeavoured to recapitulate all the various determinations which have been made, so far as I am aware, regarding the rates of mortality prevailing in these colonies, and more particularly in New South Wales; and have, I believe, been enabled to show not only that the death rates in these far off dependencies of the Empire are on the whole remarkably low, but also that they have been of late years tending considerably towards a further improvement. I might, no doubt, have set myself the task of constructing a still more recent table than any of those I have described, but probably a more fitting opportunity of doing so will be afforded after the census of 1901, when it is to be hoped that the results will be of a still more favourable character than those hitherto recorded. But after all, the question which possesses most interest for us is, whether the rates of mortality in Australia in the future will be permanently below those experienced in the mother country. We all desire more or less to look into futurity,

and are perhaps hardly so anxious to determine accurately the death rate at the present time as to endeavour to estimate what it will be several generations hence, when a purely Australian type has been fully formed. Doubtless Australia possesses at present a decided advantage over the older country, but it may be that if a time should ever arrive when this vast Continent is as thickly peopled as England is now, most, if not all, of this advantage may disappear, seeing that the comparative sparseness of population is one of the greatest factors conducing to our present favourable position.

L'Assurance sur la Vie par la Caisse Générale d'Épargne et de Retraite de Belgique.

RAPPORT DE M. Fl. HANKAR,

Membre Agrégé de l'Association des Actuaires Belges, Premier Directeur à la Caisse Générale d'Épargne et de Retraite.

L'esprit d'épargne est fortement développé en Belgique et la majeure partie des déposants à la Caisse Générale d'Épargne et de Retraite appartient à la classe ouvrière; on peut dire que c'est sous cette forme élémentaire que la prévoyance a reçu le plus d'extension.

On constate cependant que la propagande très active de la Caisse Générale d'Épargne et de Retraite, secondée par les efforts des chefs d'industrie et des sociétés mutualistes, a eu pour résultat l'affiliation à la Caisse de Retraite d'un nombre d'ouvriers chaque année plus considérable.

Au 31 décembre 1897, le nombre des déposants à la Caisse d'Epargne était de 1,371,152, et le nombre des affiliés à la Caisse de Retraite de 64,000 pour une population totale de plus de six millions d'habitants (6,410,783 au 31 Décembre 1895).

L'assurance sur la vie est, au contraire, peu répandue en Belgique: elle était à peu près inconnue dans la classe ouvrière avant la loi de 1889 sur les habitations ouvrières qui, tout en accordant des réductions fiscales aux ouvriers qui acquièrent leur habitation, a en outre autorisé la Caisse Générale d'Épargne et de Retraite à traiter des opérations d'assurances mixtes, permettant ainsi à cette Institution de compléter, selon les vues d'ensemble indiquées par l'exposé des motifs du 29 juin 1849, l'organisme de prévoyance institué par la législature le 8 mai 1850.

En vertu de la loi du 9 août 1889, la Caisse d'Épargne fait des avances de fonds, dans des conditions déterminées, à des sociétés ayant pour objet de prêter de l'argent aux ouvriers qui désirent se construire ou acquérir une habitation. Les prêts ainsi effectués sont, en général, garantis par une *assurance mixte* reposant sur la tête de l'ouvrier emprunteur et dont la société est bénéficiaire.

L'organisation d'une Caisse qui assure le remboursement, en cas de

décès prématuré d'un emprunteur ouvrier, des sommes mises à sa disposition pour acquérir une habitation, est de nature à faire connaître rapidement, par la voie de l'exemple, la meilleure qui soit, les avantages de l'assurance sur la vie. D'un autre côté, il est à espérer que les efforts faits par les personnes qui administrent des sociétés d'habitations ouvrières pour amener leurs emprunteurs à s'assurer, continueront à produire de bons effets dans la classe ouvrière proprement dite ; on peut espérer que cette heureuse influence se manifestera également dans la petite bourgeoisie qui, pas plus que la classe ouvrière, ne connaît en Belgique l'assurance sur la vie.

La Caisse d'assurances sur la vie est annexée à la Caisse de Retraite; elle se compose de deux Caisses, distinctes au point de vue de la nature des opérations traitées et de la statistique, mais réunies au point de vue comptable en un organisme unique.

Cette subdivision a été maintenue, parce que la première de ces Caisses, celle fondée en 1891, s'adresse presque exclusivement aux ouvriers et qu'il a semblé intéressant, pour l'avenir, d'examiner s'il ne serait pas possible de trouver là des indications sur la mortalité dans cette classe particulière de la population. Sans vouloir préjuger dès à présent de la valeur des déductions que l'on pourrait retirer des renseignements recueillis, il a paru nécessaire tout au moins de rendre la chose possible. Certes, l'ouvrier qui s'assure pour acquérir une maison est un ouvrier prévoyant, puisqu'il doit, avant de pouvoir contracter un emprunt, posséder au moins $1/10^{e}$ de la valeur de l'immeuble, et les conclusions que l'on pourrait tirer des données fournies par les statistiques établies sur les affiliés à cette Caisse ne pourraient s'appliquer entièrement à la classe ouvrière en général. Quoi qu'il en soit, il y aura là une source de précieux renseignements. Cette première Caisse ne fait que des assurances mixtes.

Au contraire, la Caisse fondée en exécution de la loi du 21 juin 1894, et qui a commencé ses opérations vers la fin de l'année 1896, traite des opérations d'assurances mixtes et d'assurances vie-entière à primes viagères et temporaires; elle est, de plus, accessible à tous directement, c'est-à-dire sans l'intermédiaire d'une société ni d'aucun autre organisme.

Nous allons examiner successivement ces deux Caisses d'assurances sur la vie.

Caisse d' assurances mixtes sur la vie créée en exécution de la loi du 9 août 1889 sur les Habitations Ouvrières.

La Caisse d'Assurances mixtes a commencé ses opérations le 1er septembre 1891. Elle fut fondée en exécution de l'article 8 de la loi du 9 août 1889, relative aux Habitations ouvrières, ainsi conçu :

" La Caisse Générale d'Epargne et de Retraite est autorisée à traiter " des opérations d'assurances mixtes sur la vie ayant pour but de garantir " le remboursement à une échéance déterminée—ou à la mort de l'assuré " si elle survient avant cette échéance—des prêts consentis pour la " construction ou l'achat d'une habitation.

" Les conditions générales, ainsi que les tarifs de ces assurances " seront soumis à la sanction royale.

" L'Arrêté royal mentionnera la Table de mortalité, le taux d'intérêt

" et le prélèvement pour frais d'administration qui auront servi de bases " à l'élaboration du tarif."

L'Arrêté royal, dont il est question à l'article 8 ci-dessus, parut le 6 juillet 1891, et détermina les conditions générales de fonctionnement du nouvel organisme. Les tarifs devant servir de base au calcul des primes d'assurance étaient annexés à cet Arrêté royal; il y est tenu compte :

A—De l'intérêt composé à 3 p.c. l'an ;

B—Des chances de mortalité calculées d'après la Table dite " English Life Table No. 3 (Males)," publiée par William Farr, en 1864 ;

C—D'un chargement de 3 p.c. pour frais d'administration.

Les polices sont souscrites, sur la tête de leurs débiteurs, par les créanciers qui sont en général des sociétés d'Habitations Ouvrières. Les assurances sont mixtes et pour un terme de 10, 15, 20 ou 25 ans.; les primes sont indivisibles et payables par anticipation. Le reçu de la prime est donné sur le livret-police qui a été remis à chaque bénéficiaire de contrat.

Les versements et paiements pour le service de cette Caisse d'Assurances se font par l'intermédiaire des agences de la Banque Nationale en province et à la Caisse Centrale à Bruxelles.

L'assurance peut être résiliée, avec l'agréation de l'assuré, sur la demande du bénéficiaire de la police, dans les conditions fixées par l'Arrêté royal ; en cas de non-paiement d'une prime à son échéance, l'assurance est résiliée de plein droit.

La liquidation des contrats se fait à l'intervention des bureaux cités plus haut et contre remise des pièces relatives au décès.

Comme on le voit par ce qui précède, cette Caisse d'Assurances fut créée dans un but très spécial et s'adresse à une population particulière.

En vue d'assurer, dans le plus grand nombre de cas possible, le remboursement des prêts consentis, en cas de décès prématuré des emprunteurs, la Caisse Générale d'Épargne et de Retraite cherche à augmenter le nombre des ouvriers affiliés.

Le tableau qui suit permet de se rendre compte de la marche générale de cette Caisse :

CAISSE D'ASSURANCES (Loi du 9 août 1889).

—		31 decembre.				
		1893	1894	1895	1896	1897
	Nombre de contrats.	1,520	2,538	3,719	5171	6873
	Capitaux assurés.	3,823,033.02	6,280,469.97	9,024,105.47	12,134,722.06	16,031,651.06
Statistique professionnelle des assurés.	Ouvriers mineurs, houilleurs.	254	437	567	758	927
	Ouvriers d'industrie ou exerçant un métier quelconque.	984	1,643	2,403	3,260	4,080
	Journaliers, ouvriers agricoles.	137	230	400	650	1,020
	Ménagères	9	12	33	49	64
	Agents inférieurs d'administration.	102	155	212	300	548
	Nombre d'assurés . . .	1,486	2,477	3,651	5,017	6,639

On constate en examinant ce tableau l'accroissement régulier du nombre des contrats et des capitaux assurés. L'écart qui existe entre le nombre des contrats et celui des assurés provient de ce que quelques affiliés ont plusieurs contrats ; c'est d'ailleurs l'exception.

Les effets de la propagande entreprise par la Caisse Générale d'Epargne et de Retraite en vue de répandre les idées d'assurance sur la vie dans la classe ouvrière sont mis en évidence par le tableau qui suit, lequel indique, pour les divers exercices, le rapport du nombre total d'opérations contractées avec assurances au nombre total des opérations.

Année. (1)	Nombre total de prêts. (2)	Nombre de prêts avec assurance. (3)	Rapport, en millièmes, du nombre de prêts avec assurance au nombre total de prêts. (4)
1891	52	11	212
1892	753	473	628
1893	1764	1364	773
1894	2921	2306	789
1895	4360	3443	790
1896	6110	4914	804
1897	8078	6560	812

La tendance que voulait créer la Caisse Générale se manifeste par la constante augmentation des rapports de la colonne (4), rapports qui vont en croissant très régulièrement. Il faut, de plus, remarquer qu'il n'est point possible, pour différentes raisons, et particulièrement pour des motifs d'ordre médical, d'assurer tous les ouvriers qui désirent devenir propriétaires ; nous pensons que les résultats actuellement acquis, en ce qui regarde le nombre de prêts avec assurance par rapport au nombre total des prêts, ne pourront que difficilement être notablement dépassés dans l'avenir.

Caisse d'Assurances sur la vie créée en exécution de la loi du 21 *juin* 1894.

Par la loi du 21 juin 1894, une Caisse d'Assurances sur la vie a été annexée à la Caisse de Retraite ; les conditions de fonctionnement de l'organisme nouveau ont été réglées par une délibération du Conseil Général, approuvée par un Arrêté royal en date du 16 juin 1896.

Cette Caisse assure des capitaux n'excédant pas frs. 5000, sur une tête déterminée, au moyen de primes annuelles constantes de 10 francs au moins. Il peut être fait des versements de primes uniques, mais celles-ci ne peuvent être supérieures à trois fois la prime constante annuelle fixée à l'origine du contrat ; ces primes uniques ne sont converties en assurances que deux ans après le versement si l'assuré est vivant à cette époque. Les assurances sont mixtes ou vie-entière et les primes cessent d'être payables à 55, 60 ou 65 ans ; il peut être stipulé que la somme assurée sera, à l'échéance du contrat, versée à capital aliéné à la Caisse de Retraite et employée à l'acquisition de rentes au profit du ou des bénéficiaires.

Les bases techniques sont les mêmes que celles qui ont été employées pour l'établissement des tarifs de la première Caisse. La Table de mortalité employée étant assez rapide, la sélection médicale peut ne pas être exercée avec la même rigueur que dans les Compagnies privées qui font usage de tables lentes établies sur des résultats statistiques fournis

par des observations portant sur des têtes sélectionnées. Les frais de constatations médicales sont à la charge du preneur d'assurance.

Nous croyons devoir appeler spécialement l'attention sur l'article 13 des conditions générales qui fixe les règles du remboursement en cas de décès causé par la guerre ou une émeute ; nous le reproduisons ci-après :

" Art. 13.—En cas de décès de l'assuré causé par la guerre ou par " une émeute, la Caisse rembourse la valeur de rachat augmentée du " vingtième de la différence entre le capital assuré et cette valeur de " rachat.

" A la fin de l'exercice, la Caisse répartit entre les bénéficiaires des " contrats éteints par décès causé par la guerre ou une émeute, au marc " le franc des valeurs de rachat correspondantes, les huit dixièmes des " bénéfices réalisés pendant cet exercice, sans que la part attribuée à " chacun dans cette répartition, augmentée de la somme correspondante " déjà remboursée, puisse dépasser le capital assuré."

La valeur de rachat des polices ne peut être obtenue par le preneur d'assurance que lorsqu'il se trouve incapable de pourvoir à sa subsistance, alors que son existence dépend de son travail.

Si la prime constante n'est pas payée dans le mois de son échéance et s'il n'y a point provision de prime unique non convertie en assurance, c'est-à-dire versée depuis moins de deux ans, l'assurance est réduite. La police est remplacée par une police nouvelle ne comportant plus aucun paiement de prime et dont le capital assuré, calculé d'après des règles fixées par la délibération du Conseil Général, est exigible dans les mêmes conditions que la police primitive.

Nous avons encore, avant de terminer ce rapide exposé, à signaler les deux derniers articles de l'Arrêté royal qui sont extrêmement importants :

" Art. 19.—La Caisse peut exempter de toute visite médicale les " membres d'une société de secours mutuels reconnue, s'affiliant globale- " ment en vue d'une assurance vie-entière, sauf les exceptions résultant " des conditions d'âge fixées par les tarifs, en vertu d'un règlement ou " de statuts ; dans ce cas, le minimum fixé à l'article 15 pour la prime " annuelle temporaire et viagère peut être abaissé à 1 franc et le capital " assuré ne peut dépasser 100 francs."

" Art. 20.—Tous les cinq ans, le Conseil Général de la Caisse " Générale, sur la proposition du Conseil d'Administration, peut décider " qu'il y a lieu de répartir entre les preneurs d'assurance tout ou partie " de la différence entre le montant du fonds de réserve de la Caisse " d'Assurances et le dixième des réserves mathématiques pour risques " en cours.

" Cette répartition s'appliquera aux contrats en cours depuis cinq " ans au moins et s'effectuera au marc le franc du montant des primes " annuelles constantes."

Comme on le voit par l'article 19, la Caisse Générale est autorisée à se substituer aux sociétés de secours mutuels qui garantissent le payement des frais funéraires à leurs membres, véritable opération d'assurance toujours dangereuse pour des organismes qui, pour des raisons de surveillance mutuelle, sont forcément limités à un nombre de membres assez peu considérable et qui sont généralement habitués à fixer, d'après des règles tout-à-fait empiriques, la prime annuelle qui donne droit au payement d'un capital déterminé au décès. Nombreuses

sont les sociétés mutualistes qui, au point de vue des pensions de vieillesse, servent d'intermédiaires entre leurs membres et la Caisse de Retraite ; il est à espérer que lorsque la disposition que nous venons de signaler sera mieux connue, les sociétés de secours mutuels n'hésiteront pas à bénéficier de la faveur qui leur est accordée.

L'article 20 a en vue de permettre de répartir entre les preneurs d'assurance, dans des conditions d'extrême prudence, l'excès des bénéfices. Nous pensons ne pas devoir insister sur les avantages de cette disposition.

Les versements de primes et les remboursements se font par l'intermédiaire des bureaux ouverts au service de l'épargne ; ceux ci sont très nombreux (près de 900) répartis dans tout le pays. Les formalités ont été réduites à un minimum en vue de rendre ces assurances accessibles à toutes les classes de la société.

Au 31 décembre 1897, cette Caisse d'Assurances comportait 64 contrats et, sauf deux exceptions, les assurés appartiennent à la classe bourgeoise et les capitaux assurés se rapprochent, en moyenne, du capital maximum de 5000 francs.

Translation.

Life Assurance by the Caisse Générale d'Épargne et de Retraite, of Belgium. By Fl. Hankar, *Fellow of the Association of Belgian Actuaries. First Manager of the Caisse Générale d'Épargne et de Retraite.*

The spirit of saving is highly developed in Belgium, and the larger number of the depositors in the Caisse Générale d'Epargne et de Retraite belong to the working classes. It may be said that it is in this elementary shape that thrift has undergone the greatest expansion.

It is true, nevertheless, that the very active propaganda of the Caisse Générale d'Epargne et de Retraite, seconded by the efforts of employers and of friendly societies, has resulted in the affiliation to the Caisse de Retraite of a number of workmen, each year more considerable.

On 31 December 1897, the number of depositors in the Caisse d'Epargne (Savings Bank) was 1,371,152, and the number of members of the Caisse de Retraite (Pension Fund) was 64,000, out of a total population of over six millions (6,410,783 on 31 December 1895).

Life assurance, on the contrary, is little practised in Belgium. It was almost unknown among the working classes previous to the law of 1889 on workmen's dwellings, which, while granting fiscal abatements to those workmen who become owners of their own dwellings, authorized besides the Caisse Générale d'Epargne et de Retraite to enter into endowment assurance contracts, thus enabling that institution to complete, according to the general views contained in the Parliamentary Report of 29 June 1849, the provident organization established by the Legislature on 8 May 1850.

Under the law of 9 August 1889, the Caisse d'Epargne makes advances, under specified conditions, to societies having for object to grant loans to workmen who wish to build or to purchase dwellings. The loans thus carried out are usually collaterally secured by an endowment assurance on the life of the borrowing workman, and of which the society is the beneficiary.

The establishment of a fund, which provides for the repayment in case of the premature death of the borrowing workman of the money placed at his disposal for the purpose of providing himself with a home, is of a nature to make known rapidly by means of example, the best possible means, the advantages of life assurance. On the other hand, it is to be hoped that the efforts made by people managing workmen's building societies to induce their borrowers to assure their lives, will continue to have good results among the class of workmen

properly so called. It is also to be hoped that this happy influence will equally manifest itself among the small townspeople, who, similarily to the working classes, know nothing of life assurance.

The life assurance branch is incorporated with the Caisse de Retraite. It consists of two Departments, separate as regards the nature of the transactions entered on, and for the purpose of statistical records; but as regards accounts united into one institution.

This sub-division has been retained, because the first of these departments, that established in 1891, caters almost exclusively for the working classes, and it was thought that it would be interesting in the future to see if it would be possible to find there indications of the mortality prevailing in that particular stratum of the population. Without judging in advance of the value of the deductions which may be derivable from the observed facts, it seemed desirable at least to make the thing possible. Certainly the workman who assures in order to provide for himself a dwelling is a thrifty man, because he must, before he can take out a loan, possess at least one-tenth of the value of the property; and the deductions that it may be possible to draw from the data derived from statistics of the members of that department would scarcely apply in their entirety to the working classes generally. Nevertheless, there will be available a source of valuable information. This first department grants only endowment assurances.

On the other hand, the Department established under the law of 21 June 1894, and which commenced its operations towards the end of 1896, grants endowment assurances, and whole life assurances by uniform or limited payments. It is, moreover, directly accessible to all, that is, without the intervention of a society or of any other organization. We shall examine in their order these two Life Assurance Funds.

Endowment Assurance Fund, established under the law of 9 August 1889, relating to Workmen's Dwellings.

The Endowment Assurance Fund commenced its operations on 1 September 1891. It was established under Article 8 of the law of 9 August 1889, relating to workmen's dwellings, which runs as follows:—

> "The Caisse Générale d'Epargne et de Retraite is empowered to "transact endowment assurance business which has "for object the securing repayment, at the end of a "fixed period, or on the death of the assured before "the end of such period, of loans granted for the "building or purchase of dwellings.
>
> "The general conditions, as well as the rates of premium, for "these assurances, shall be submitted for Royal "approval.
>
> "The Royal Decree shall name the mortality table, the rate of "interest, and the loading for working expenses, "which shall have been made use of in calculating "the tables of rates."

The Royal Decree, mentioned in Article 8 above, was issued on 6 July 1891, and fixed the general working conditions of the new

organization. The data to be used in calculating the premiums were embodied in the Royal Decree, and include :—

(*a*) Compound interest at 3 per-cent per annum.
(*b*) Rates of mortality calculated by the English Life Table (Males), published by William Farr in 1864.
(*c*) A loading of 3 per-cent for working expenses.

The policies are taken out, on the lives of the borrowers, by the lenders, who are usually workmen's building societies. They are endowment assurances, for a term of 10, 15, 20, or 25 years. The premiums are indivisible, and payable in advance. The receipt for the premium is given in the policy-booklet supplied to the beneficiary under each contract.

The receipts and payments of the Fund are carried out through the agencies of the National Bank in the provinces, and at the central office in Brussels.

The assurance may be cancelled, with the consent of the life assured, at the request of the beneficiary under the policy, under conditions laid down in the Royal Decree. In case of the non-payment of a premium when it falls due, the assurance is cancelled *ipso facto*.

The payment of claims is made through the agency of the offices mentioned above, on receipt of documents in proof of death.

As may be seen from what is said above, this assurance fund was established for a very special object, and appeals to a special class of people.

With the view to secure, in the largest possible number of cases, the repayment of loans in case of the premature death of borrowers, the Caisse Générale d'Epargne et de Retraite seeks to increase the number of the workmen entering it.

The following table shows the progress of this Fund :—

Assurance Fund. (Law of 9 August 1889).

		31 December				
		1893	1894	1895	1896	1897
Number of Contracts		1,520	2,538	3,719	5,171	6,873
Sums Assured . . .		3,823,033·02	6,280,469·97	9,024,105·47	12,134,722·06	16,031,651·06
Particulars of the Trades of the Assured.	Miners & Coal Miners . .	254	437	567	758	927
	Artizans and those engaged in any craft.	984	1,643	2,403	3,260	4,080
	Journeymen & Agricultural Laborers .	137	230	400	650	1,020
	Housewives .	9	12	33	49	64
	Lower grade Officials of public departments. . .	102	155	212	300	548
Number Assured . .		1,486	2,477	3,615	5,017	6,639

One observes, on examining this table, the steady growth of the number of contracts, and of the amount assured. The difference which exists between the number of contracts and the number assured arises from the fact that some members have several contracts; but this is exceptional.

The effect of the propaganda, undertaken by the Caisse Générale d'Epargne et de Retraite with the view of spreading the idea of life assurance among the working classes, is displayed in the following table, which shows for the several financial years the ratio between the number of transactions which include life assurance, and the total number of transactions :—

Year (1)	Total Number of Loans (2)	Number of Loans with Assurance (3)	Rates per thousand of the Number of Loans with Assurance to the Total Number of Loans (4)
1891	52	11	212
1892	753	473	628
1893	1764	1364	773
1894	2921	2306	789
1895	4360	3443	790
1896	6110	4914	804
1897	8078	6560	812

The movement which the Caisse Générale desired to bring about is displayed in the constant growth in the ratios in Col. 4, ratios which increase with great regularity. It must, however, be remarked that it is not possible for various reasons, and especially on account of medical considerations, to grant assurances on the lives of all the workmen who wish to own their dwellings. We think that the results already achieved in respect of the number of loans with assurance, as compared with the total number of loans, can only with difficulty be surpassed in future.

Assurance Fund Established under the Law of 21 June 1894.

By the law of 21 June 1894, a Life Assurance Fund was added to the Caisse de Retraite. The conditions of the working of the new organization were determined by a minute of the General Council, confirmed by a Royal Decree of date 16 June 1896.

This fund assures sums not exceeding 5,000 francs on one life, by uniform annual premiums of at least 10 francs. Lump sums may be paid, but these must not exceed three times the uniform annual premium fixed at the commencement of the contract; and these lump sums are not converted into assurance until two years after payment, if the assured be then alive. The policies are for endowment assurances, or for the whole of life, and the premiums cease at 55, 60, or 65 years of age. It may be arranged that the sum assured shall, at the maturity of the contract, be paid to the Caisse de Retraite as a premium without return, for the purchase of an annuity for the benefit of the beneficiary or beneficiaries.

The technical basis is the same as that employed in calculating the rates of the first Fund. The mortality table showing a heavy death rate, medical examination need not be so strict as with private

companies, which use less stringent tables, based upon statistics of select lives. The medical fee is paid by the applicant.

We think it desirable to call special attention to Art. 13, setting forth the general conditions which regulate payment in the event of death caused by war or by a riot. It runs as follows:

> "Art. 13. In the event of the death of the life assured "caused by war or by a riot, the Fund shall pay the "surrender-value increased by one twentieth part of "the difference betwen the sum assured and such "surrender-value."
>
> "At the end of the financial year the Fund shall divide "between the beneficiaries under contracts terminated "by death caused by war or by a riot, in proportion "to the corresponding surrender-values, eight tenths "of the profits realized in that year, provided always "that the sum allotted to each in this division, added "to the corresponding sum already paid, shall not "exceed the sum assured."

The surrender-value of a policy may be claimed by the assured, only should he be unable to provide for his own sustenance, and then only if that depend on his own work.

If the periodical premium is not paid during the month in which it falls due, and if there are no lump sums not yet converted into assurance, that is, which have been paid in within less than two years, the sum assured is reduced. For the policy is substituted a new one not subject to any premium, and under which the sum assured, calculated according to the rules laid down in the minutes of the General Council, is payable under the same conditions as that under the original policy.

We must, before closing this brief statement, call attention to the last two articles of the Royal Decree, which are very important.

> "Art. 19. The Fund may waive all medical examination "in the case of a registered friendly society affiliating "itself bodily, with the view of securing whole life "assurances, but with such exceptions as may arise "from the limits of age laid down in the tables of "rates, under a resolution or under the constitution "of the society. In such case the mimimum laid "down in Art. 15 for the temporary annual life "premium may be reduced to one franc, and the sum "assured must not exceed 100 francs."
>
> "Art. 20. Every five years the General Council of the Caisse "Générale, on the suggestion of the board of manage- "ment, may decide to distribute between the holders "of policies the whole or a part of the difference "between the reserve fund of the Assurance Fund, "and one-tenth of the mathematical reserve for "current risks. Such distribution shall be made "among policies which have been in force at least "five years, and shall be in proportion to the amount "of the uniform annual premiums."

As appears by Art. 19, the Caisse Générale is permitted to take the place of friendly societies which provide funeral benefits for their members, real assurance operations always dangerous for institutions which, in order to make sure of mutual supervision, must necessarily limit their membership to a small number, and which are generally accustomed to fix by purely empirical methods the annual premium to provide a fixed sum at death. The friendly societies are numerous, which, from the point of view of old age pensions, act as intermediaries between their members and the Caisse de Retraite; and it is to be hoped that, when the arrangement to which we have just referred becomes better known, the friendly societies will not hesitate to take advantage of the opportunity offered them.

Art. 20 is designed to permit of the distribution among the policyholders, under extremely safe conditions, of the surplus profits. It seems scarcely necessary to urge the advantages of this arrangement.

The collection of premiums, and the payments to the assured, are made by means of offices opened on behalf of the Savings Bank Department. These are very numerous (nearly 900), scattered over the whole country. Formalities have been reduced to a minimum, with the view of bringing these assurances within the reach of all classes in the community.

On 31 December 1897, this Assurance Fund included 64 contracts, and with few exceptions the assured belong to the small townsfolk class, and the sums assured approximate as a rule to the maximum of 5,000 francs.

Discussion.

M. Hankar, in introducing his paper said,

The Caisse Générale d'Epargne et de Retraite has been empowered to transact life assurance business only during the past few years. Its operations are carried on under very special conditions, and it seemed to him that it would be interesting to make a few general remarks on the subject of the new organization.

There would be found in the paper, which he had the honour to submit to the Congress, information on the present position of the Caisse d'Epargne and of the Caisse de Retraite; that information will enable, by comparisons, due appreciation to be arrived at of the value of the figures which will be brought forward relating to the assurance transactions.

As a general rule, life assurance is but little practised in Belgium. It is known among the industrial classes only through the propaganda undertaken in its favour by loan societies having for object to facilitate the acquisition of their dwellings by working men. Endowment Assurances granted by the Caisse Générale d'Epargne et de Retraite are intended to secure the repayment, in the event of the premature death of the borrower, of the amount lent to him by societies established for the purpose of increasing the number of workmen's dwellings. These societies place at the disposal of workmen, who wish to become proprietors, the money necessary to build or purchase a house.

The funds necessary to these societies to carry on their business are generally provided by the Caisse d'Epargne, which may place at their disposal one twentieth of the total amount of its investments. The amount of the funds thus advanced by the Caisse exceeds at the present time 18,000,000 francs. In order to increase the number of workmen assured, most favourable conditions are offered by the Caisse to the societies which grant loans secured by policies on the lives of the borrowing workmen. These steps have had for result a considerable increase in the number of

La Caisse Générale d'Epargne et de Retraite n'est autorisée à traiter des opérations d'assurances sur la vie que depuis quelques années seulement. Ces opérations se font dans des conditions assez spéciales, et il m'a semblé qu'il pouvait y avoir quelque intérêt à donner des indications générales au sujet de l'organisme nouveau.

On trouvera dans le rapport que j'ai eu l'honneur de déposer sur le bureau du Congrès quelques renseignements au sujet de la situation actuelle de la Caisse d' Epargne et de la Caisse de Retraite; ces renseignements permettront d'apprécier, par comparaison, la valuer des chiffres qui seront cités à propos de l'assurance.

D'une manière générale, l'assurance sur la vie est peu pratiquée en Belgique; elle n'est connue, dans la classe des travailleurs manuels, que par la propagande faite en faveur de l'assurance par des sociétés de crédit ayant pour objet de faciliter l'acquisition de maisons par des ouvriers. Les assurances mixtes consenties par la Caisse Générale d'Epargne et de Retraite ont pour objet d'assurer le remboursement, en cas de décès prématuré de l'emprunteur, des sommes qui lui ont été avancées par des sociétés ayant pour but d'augmenter le nombre des maisons ouvrières. Ces sociétés metent à la disposition des ouvriers qui désirent devenir propriétaires, les fonds nécessaires pour construire ou acquérir une habitation.

Les fonds nécessaires pour assurer le fonctionnement de ces sociétés sont en général fournis par la Caisse d'Epargne, qui peut mettre à leur disposition un vingtiéme du montant total de ses placements. Le montant des sommes ainsi avancées par la Caisse dépasse actuellement dix-huit millions de francs. En vue d'augmenter le nombre des ouvriers assurés, des conditions plus favorables sont accordées par la Caisse d'Epargne aux sociétés qui consentent des prêts garantis par des assurances reposant sur la vie des ouvriers emprunteurs. Cette mesure a eu pour résultat une augmentation

transactions carried out with life assurance.

The Caisse Générale d'Epargne grants also, but only since about a year ago, whole life assurances by limited payments, not having for object the ultimate repayment of a loan. As the transactions of this second kind do not appeal to the same class of the population as the endowment assurances, of which he had already spoken, it has been decided to keep separate, at any rate for statistical purposes, the whole-life assurances from the endowment assurances.

M. Hankar then gave some technical and statistical information on the subject of these two categories of life assurance transactions.

In drawing attention to the smallness of the number of assurances of the second category, M. Hankar thought that probably the time was not far distant when the Caisse Générale d' Epargne et de Retraite would be empowered to enter on life assurance operations calculated to meet other requirements, and to enlarge the list of schemes offered to the public. Better than any other financial institution, the Caisse Générale, on account of its numerous points of contact with the public, and of the confidence which it engenders, is qualified to initiate and to develop the practice of life assurance in the populous centres.

La Caisse Générale d'Epargne traite également, mais depuis une année environ, des opérations d'assurances, vie entière à primes viagères et temporaires, n'ayant point pour objet le remboursement éventuel d'un prêt. Comme les opérations de cette deuxième catégorie ne s'adressent pas à la même partie de la population que les opérations d' assurances mixtes dont j'ai eu l'occasion de parler déjà, il a été décidé de séparer, au moins pour la statistique, la Caisse d'Assurances vie entière de la Caisse d'Assurances mixtes.

Je donne ensuite quelques renseignements techniques et statistiques au sujet de ces deux Caisses d'Assurances sur la vie.

En attirant l'attention sur le nombre peu considérable des assurés de la deuxième caisse, je pense que le temps n'est peut être pas éloigné où la Caisse Générale d'Epargne et de Retraite sera autorisée à traiter des opérations d'assurances sur vie répondant à d'autres nécessités, et à pouvoir élargir le cadre des combinaisons mises à la portée du public. Mieux que nul autre établissement financier, la Caisse Générale, par ses nombreux points de contact avec le public, et par la confiance qu'elle inspire, est à même de provoquer et de développer la pratique de l'assurance sur la vie dans les milieux populaires.

Discussion.

M. A. Begault (Belgium) said that after what had just been stated by M. Hankar about the assurance transactions entered into by the Caisse Générale d'Epargne et de Retraite de Belgique, it would doubtless seem interesting to the Congress to learn what private initiative had begun to do in Belgium in these matters. The Compagnie Belge des Assurances Générales makes loans for building purposes. It does not deal with the same class as the Caisse d'Epargne, but with the class of clerks and officials.

He would not have said anything to this Congress if already, beyond the frontiers of Belgium, M. Cheysson, who took part in the Congress of Brussels, and whom all deeply regretted not to see present, had not already spoken about it. In 1896, at the "Cheap Dwellings" Congress, M. Cheysson extolled the initiative taken by the Compagnie Belge. Since that time the idea had developed, and in four months the company had made loans to the extent of 500,000 frs. (£20,000) on this kind of security—more than in the whole year 1897.

The method is the same as that of the Caisse d'Epargne. An endowment assurance secures the re-imbursement of capital after the expiration of the period of the loan, or in case of the death of the borrower.

The amount lent is 70 and even 80 per-cent of the total value of the house.

The only form adopted was formerly a loan repayable by annuities-certain; the greatest inconvenience was occasioned by a heavy burden being left to the widow in case of the husband's death. At the moment of such death the provision for the annuities remaining due, if the widow was unable to continue the regular payments, absorbed the whole value of the house sold, and all the savings of former years were lost.

The method adopted by the Belgian company secures the preservation of the domestic hearth to a class which is not altogether the working class, but is quite as worthy of sympathy.

Dr. Gerkrath (Germany) said that the object of the Caisse Générale d'Epargne et de Retraite de Belgique did not in one respect refer specially to life assurance. The question was, whether and how far it is to be recommended, and desired, by the workman himself? The speaker made some statements as to the experience which he had had in Germany in this respect; it showed, on the whole, that the workman himself saw obstacles to his contracting for the acquisition of a house. Experiments made by building societies in connection with life assurance companies led to quite a different result. The object was to facilitate the acquisition of a villa, by means of a small instalment and a life assurance policy, by the middle classes, officials, teachers, employees of the large banks, &c. These experiments were, of course, only made in large towns, and were nearly always successful; but, with the success, the value of the ground increased, and then there were, in place of the less wealthy persons, those who could buy a villa without life assurance; and the assurance companies in consequence ceased to interest themselves in the further development of the system. This experience will be repeated elsewhere.

The Limitations of the System of Net Valuations.

By Walter S. Nichols.

Introductory.

This topic is not of my own selection. It has been chosen by my friend, the late Mr. Sheppard Homans, as a subject of personal interest. In attempting, at a late hour, to treat it by request, I shall not presume to take his place, nor to proclaim what I might imagine to be his views. His long and prominent service in the cause of life insurance had placed Mr. Homans in the front rank of American actuaries. His kind heart and unassuming ways had created strong ties of personal esteem on the part of those of us who recognized the high order of his talents. The eulogy, so familiar in America, was unspoken at his burial. They laid him away with a simple service for the dead, but honoured as a man whose death was felt to be a public loss. These few words of personal tribute seem fitting in this connection to one who was a member of the first International Congress of Actuaries, and a participant in its proceedings.

When Dr. Sprague, in a report to the last International Congress, had summarized and extended those sentiments regarding the valuation of policies in relation to the expense of new business which he had previously advocated in the *Journal of the Institute of Actuaries*, Mr. Homans arose and expressed his hearty concurrence in the general views of that eminent actuary. He then remarked that the same logic which justified an extra expense for new business necessitated a recast of the method of determining the proper net reserve. The system of net valuations, he declared, "is in no proper "sense a final or complete test of solvency. It is rather a means of "demonstrating that the fundamental conditions governing the "business have been faithfully observed and carried out." The thoughts that were uppermost in Mr. Homans' mind seem obvious. I suspect that he was thinking of the serious defects which our American system of net valuations had developed, of young and struggling companies which he had seen strangled through its misapplication, of the fallacious tests of insolvency and relative strength by which the American public was often misled in official reports, and perhaps more than all of the inequities which were forced upon his own contribution plan of dividends through its misuse. At any rate, it is on these general lines that I propose to discuss the topic.

As is well known, the net valuation method is the central feature of the whole American system. To understand the full significance of

this fact a brief historic retrospect is needed. In Europe, life insurance was a natural growth in which the development of its scientific principles went hand in hand with their practical application. In America, it was an exotic introduced as a business known to be successful in England. With us it was considered a commercial undertaking to be conducted like fire insurance or banking, with both of which it was frequently allied in the earlier institutions which preceded our present companies. We borrowed our rates and contract forms from abroad, and with little knowledge of the principles at first, treated this business as an ordinary mercantile venture, requiring only the skill of the accountant to adjust the income and outgo of the company. If an apparent surplus arose the methods of the banks and fire offices suggested its proper treatment. The actuary was almost unknown. Epidemics were objects of dread. Apprehension that the death-rate would prove excessive and render the borrowed rates inadequate, for years overshadowed all other questions. Under such conditions the soil was ripe for implanting a system of net valuations. As in a bank or fire company, the cash in hand, after providing for the obligations, represented to the practical managers the surplus payments, which in true mercantile fashion should be returned as dividends.

A previous experience with other classes of financial institutions, too, had helped to formulate our life insurance system.

Wild-cat banks had cursed the country. Two great fires in 1835 and 1845 had overwhelmed our stock fire companies. Swarms of irresponsible mutual corporations had been organized in their place, whose rapid failures became a public scandal. The natural result of both was an attempt to remedy the defects in our financial institutions by legislation, whose cardinal feature was a sufficiency of funds in hand to balance outstanding obligations. The chief financial officers charged with the enforcement of these laws in two of our principal States soon found their task too heavy, and separate departments were created for insurance. Thus began our State supervision. By one of those seemingly unimportant accidents which sometimes determine momentous issues, the supervision of insurance in Massachusetts was soon entrusted to Elizur Wright, a former teacher of mathematics, and a man of undoubted genius, who had been prominent as a consulting actuary, and was a politician as well of pronounced and radical views. He found the laws intended to secure the proper management of insurance utterly worthless, and set about to correct this evil by what he conceived to be the only sound business rule. The practice of the companies must conform to their theory. The tabular net premium must be applied according to the assumptions on which it had been computed, and the loading must be applied just as the theory called for. A well-managed company thus restricted could not fail if its original assumptions were adequate, and if they were not, their inadequacy would soon be disclosed. No injustice would be done among the members, nor extravagance be indulged in by borrowing from the future to aid the present. Like a bank or trust company, insurance expenditures would be limited to cash in hand, on which the future had no lien. Thus, indirectly, the State would safeguard the sound management of the company. A doctrine so mercantile, so simple, and, in the main, so reasonable, proclaimed

by a State official and enforced by legislation, coming at a time when the questions of safety and dividends under a vigorous competition of new companies were paramount in the minds of an unenlightened public and accentuated by failures abroad, was accepted with little protest.

When reinforced a few years later by the failure of a foreign company which was unable to stand this test, few in America at first had the hardihood to arraign a net valuation as a fallacious test of sound management. But it is safe to say that neither its sponsors nor American life experts in general realized all the results that would flow from the adoption of this Governmental standard. The substitution of the idea of solvency for sound management in its popular conception was a logical and almost necessary result. As the true determinant of surplus applicable to dividends, its infallibility was assumed. The contribution plan of dividends so universal in America was devised and applied to net valuations. The reserve which it created suggested at once a new analysis of the contract with a savings-bank fund, in a sense the property of the insured, and having as a necessary function a surrender-value to which he was assumed to be rightfully entitled. Along these lines, too, legislation followed, and courts at times lent a partial judicial sanction to the idea. Endowments, limited premium, and other complicated policy forms were largely taking the place of the simple life and term insurance of an earlier date. Competition intensified as the business grew in public favour, and the companies themselves naturally fell into line and adopted the net valuation principle as a basis for popularizing and liberalizing their contracts. Thus the germ implanted for a purely Governmental purpose expanded into a giant growth under whose shadow later life insurance in America was developed.

But it must not be supposed that American actuaries were blind to its necessary limitations or unanimous in its favour. Nearly 30 years ago Mr. McClintock contrasted the status of a policyholder taking out a $5,000 policy at the age of 15, and 10 years later another precisely similar in the same office for the same premium. (Our tabular premiums in America usually begin at age 25.) A third company at the end of a year would reinsure each on the same terms. But under a net valuation the company would be bankrupt with less than $257 reserve against the first policy. It would be perfectly solvent with $30 against the last. Mr. McClintock adds, in reference to the abuse of its application: "Away with a system so inconsistent, so dangerous, so utterly stupid." The net valuation was not prescribed by all the States. A gross valuation was even applied in New York to determine an issue of solvency, but practically it was generally adopted. It did good work in the line originally intended. But, as time has gone on and interest has fallen, and the race for business has become sharper, and struggling companies have been forced to the wall, and the organization of new companies has been prevented, and the accumulations of older policies have been called on to meet the increased cost of new business, the limitations, if not the inconsistency, of the net valuation method have been pressed home to our American experts.

Discussion.

With these preliminary remarks I shall proceed to discuss those limitations. There are certain postulates which may be laid down at the start. First: A net valuation can never, by itself, be a complete test of solvency. Commercially and legally the term insolvency has several meanings which are often confounded. It is sometimes used in the sense of simple bankruptcy or inability to respond to present obligations, sometimes to signify an ultimate inability to respond to accruing obligations, and sometimes to cover both. No system of computing liabilities which ignores future resources, whether applied to a bank, a merchant, or an insurance company, can, by itself, be a test of ultimate solvency. I do not imagine any American actuary would dispute this proposition.

In the qualitative analysis of the chemist, however, the reactions of several agents are sometimes needed to determine the character of his compound. In the same way the reaction of a net valuation may often be needed, along with other methods, to determine the quality of a company's solvency. In this sense only can it be a test.

Second. A net valuation can never, by itself, regardless of other considerations, determine the surplus which a company may divide. This is a corollary of the first. A process whose resultant will not even determine the question of solvency, cannot go farther, and of itself fix the divisible surplus.

Third. A net valuation cannot, by itself, establish the equities of the members, either as a body or as individuals. Unless we deny that the expense of the new business should exceed the expense of renewals, or that a retiring member should protect the interests of those who continue, or that a company has a right to trench on the first year's reserve in the purchase of business, or affirm that neither health nor the future premiums to be paid affect the question of re-insurance, it is obvious that a net valuation cannot be a complete measure of equity, either aggregate or individual.

Fourth. A net valuation cannot, by itself, correctly measure the comparative strength or the sound business management of the companies. This, too, is a corollary of our first proposition. If it cannot determine solvency, much less can it measure strength. If a new office cannot do business on the same scale of expenditure as an old one, if office premiums may differ, then, too, is it plain that neither strength nor management can be gauged simply by this test.

Yet, for all these purposes, a net valuation may be an important aid, and, with proper limitations, may be a useful check against either excessive expenditures and dividends, or future insolvency. Its forte is just what Mr. Homans declared, as a means of determining that the fundamental conditions governing the business have been faithfully observed.

I pass, then, to consider the nature of its limitations. It is well to remember, that in all questions relating to the insurance contract, the court, rather than the actuary, is the ultimate arbiter. Both solvency and equity are, in the last analysis, what the court decrees, and I conceive that no complete discussion of the limits to a net valuation can wholly ignore its legal relations. In the sixteenth volume of *The Institute of Actuaries' Journal*, Mr. A. H. Bailey, in an

article on "Insolvency of Life Assurance Companies", notes the fact, that when the principle of valuation was first discovered, no difficulty was involved in its application. Only the office premium was known, and the accountant's simple rule, that the present worth of the company's obligations must be met by the present worth of its future income, together with the funds in hand, was all that was needed. But when, in 1815, Milne's work on Money Values, deduced from the Carlisle Tables, gave a better knowledge of the actual cost, and caused a reduction of premiums, the conception of a net premium loaded for expenses was introduced. Then arose a new school, advocating a net valuation, to which was afterwards added a third, by way of compromise, favouring the gross valuation with a proper expense allowance. Between the rival advocates of these three schools the battle has waged ever since. According to Mr. Bailey, a company is solvent whenever

$$C + aP = A + aE \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

in which C is the realized assets, a P is the present worth of the office premium, and a E the present worth of the average expenses. De Morgan, writing earlier, in 1838, gives substantially the same formula. Apart from the special case of negative values, this is, unquestionably, in its simplest form, the true equation of ultimate theoretical solvency, and the one which, doubtless, first suggested itself to the mathematician. It may be properly termed the general equation of mathematical solvency.

Let us expand and analyze it in the light of our more modern methods. Adopting the notation of the Institute of Actuaries, where ϕ is the loading and E the average expenses chargeable against an individual policy, we may write formula (1) as follows:

$$\Sigma[(P_x + \phi_x)(1 + a_{x+n}) + {}_nV_x] = \Sigma[A_{x+n} + E(1 + a_{x+n})] \quad . \quad (2)$$

In this expanded shape we may see the chief defects in every ordinary valuation system.

First. Our formula is true only as to the aggregate summation. It is indeterminate when applied to the individual policy. With Σ removed, it no longer holds good. This controlling fact is too often lost sight of under the operation of a mental law which leads us to attribute to the constituents the qualities of their compound, and to methods the qualities of their results. The fallacy has been at the bottom of a large share of our troubles in America. It has concealed one of the most important limitations of the net valuation system, by attributing to the individual policy all the essential qualities of an aggregate of insurance.

According to the kinetic theory of gases, each given temperature has its specific pressure, due to the aggregate bombardment of free molecules moving in space. But the movement of each individual molecule is wholly indeterminate. It moves until by chance it strikes a neighbour. The average of the whole determines the pressure. But that average tells us nothing of the range of a single molecule.

When applied to the individual policy, this formula is meaningless, except as a statement of our knowledge that with policies enough the equation would hold good of their sum. If we analyze the fundamental

conception involved in all insurance, it is but a measure of our ignorance of the individual, combined with our knowledge of the group. The more we know the less we insure, and if our formula held good regarding the individual policy all insurance would be at an end. Unknowable as well as knowable events are controlled by law. Probabilities can be nothing but a measure of our partial ignorance.

In the face of these facts, so obvious to the student of probabilities, the principle involved in this formula has been largely emasculated in our practical treatment of the net reserve. It has been currently assumed, and the public in America has been taught by those high in authority, to believe, that each individual reserve is held as a distinct trust fund for the policyholder, for which he is entitled to an accounting. The fallacy has permeated our courts and legislation in America. So far has it gone, that within the past year, in Indiana, an attempt was made to tax the life policy as a *chose in action* in the hands of the owner, the value of which was the net reserve, and this attempt was only defeated by the refusal of the court to recognize such a property right in the absence of specific legislation. The same principle has been commonly treated as the basis of equitable withdrawals and apportionment of dividends. When so treated in the contract it becomes, of course, a legitimate part of the scheme, and is no longer open to the same criticisms as before, unless its application violates those fundamental principles of equity or stability on which the scheme itself rests.

But my first point is that our formula leaves the sufficiency and the equities of the individual net reserve wholly indeterminate. Whatever claims may be made for it, these must arise from considerations *dehors* those fundamental principles on which the insurance scheme, as a whole, is founded. The same arguments would apply to any attempt to individualize a gross valuation.

Second. Passing to the first factor within the brackets, we meet the underlying principle in the limitations of the net valuation.

$P_{x+}\phi_x$ is essential to the complete determination of the company's condition. Results obtained by the use of P_x only must be subordinate and partial. It can furnish only certain elements of the problem.

A net valuation, as a test of solvency or determinant of equities, must first assume the correctness of the equation

$$\Sigma[\phi_x(1+a_{x+n})]=\Sigma[E(1+a_{x+n})] \quad . \quad . \quad . \quad . \quad . \quad (3)$$

As a matter of fact, ϕ is added not simply as an offset to E, but to provide against any deficiency which may arise in P_x as well. We load for contingencies of mortality as well as expenses. There is no fixed relationship between ϕ and E. Our formula, therefore, becomes indeterminate as before, when we attempt to separate the terms of our first factor. Every limited payment policy assumes that a factor V^1 must be added to the second member to establish the equality. If it were practicable to compute by the law of error a quantity R, such that

$$R=\left[\Sigma\left\{\frac{d_{x+n+\frac{1}{2}}}{l_x}\left(P\frac{1-V^{n+1}}{1-V}-V^{n+\frac{1}{2}}\right)\right\}\right]^{\frac{1}{2}}$$

where n is the possible after life of the insured taken between nothing and the tabular limit, this quantity R would represent the theoretical

risk of granting the insurance at premium P, and is a part of ϕ, which is properly a function of P. It is the theoretical cost to a third company insuring the sufficiency of P.

Here we meet a second important fallacy, which has fastened itself on the net valuation method. No allowance under that method is made for R. Its existence is not recognized. P is treated as the entire portion of the premium applicable to the mortality element. It will be noted, too, that the risk of interest fluctuations and adverse selections, which are part of ϕ applicable to P, are also left out of view. My point is that the ignoring of ϕ in any decisive test of solvency is false, theoretically, even to the principle on which net valuations are supported. The only thing that can be done is to eliminate it by equating partial values when the special conditions of our problem permit, and this is what is in reality attempted in every application of the system. For practical purposes equation (3) is assumed to be approximately true, and we are left to deal only with known facts and tabular assumptions. The advantages of this plan are many and obvious. The practical superiority of the method for many purposes is due to them. Its limitations reduce themselves to a consideration of the cases in which equation (3) may, without serious error, be treated as true. This is the condition of an old and well-established company, whose even flow of retirants is steadily replaced by entrants at their original ages, under similar policies; whose membership is neither increasing nor decreasing; whose contracts call for equal annual premiums during their continuance; whose expenses are light and steady; whose interest and mortality are stable; which is under no constraint, either to strengthen or diminish its resources; and whose surplus is disposed of as it accumulates. Every departure from those lines adds to our error in the assumption of equality unless positive and negative errors balance.

I note, then, first, the method is unfitted, as a reliable test of a young company, or even an old company, with rapidly expanding or contracting business. The paramount legal obligation of a company is to perpetuate its existence until its purposes have been accomplished. This legal obligation is an implied element of every contract. It justifies the retention of surplus when needed, even though equities may be disturbed. It exacts of a young company such expenditures of its resources for new business, within the limits of safety, as may be needed to secure a sound average, and requires all companies, within those same limits, to maintain whatever membership is required to carry out their purposes.

This means, that to exact a fund in hand of

$$\Sigma({}_n\mathrm{V}_x) = \Sigma[\mathrm{A}_{x+n} - \mathrm{P}_x(1 + a_{x+n})]$$

may, at times, be a legal violation of the spirit both of the charter and the contract. Here we meet a fallacy very tenacious in America, and, doubtless, prevalent elsewhere, that because a company computes its premiums on a net basis, it is, in equity, at least obliged to adhere to the assumptions made for purposes of computation. No such legal relations exist, unless they are stipulated in the contract, or embodied in a statute or charter incorporated in it. The law knows nothing of net premiums, but only the stipulated payments in the policy itself. If questions of equity or solvency arise, a court will, like the actuary,

use whatever methods seem best fitted to determine the facts. The relations of the parties are what the contract makes them, not what the ingenuity of the actuary may devise for computing them. A reference to the decisions of our American courts of last resort in the case of policies lapsed through our Civil War will make this clear.

I note, again, that equation (3) will not apply to companies whose contracts are largely paid in advance, where we must write

$$\Sigma[(\phi_x, \text{ \&c.}) + {}_n\mathrm{V}^1{}_x] = \Sigma[\mathrm{E}, \text{ \&c.}]$$

V^1, which should be reserved for future expenses, is liable to be mistaken for divisible surplus.

Again, an uncertain future interest or mortuary rate disturbs the equality of equation (3), for here an indefinite function of ϕ may be called on to contribute to the deficiency of either. Lapses and withdrawals are pregnant illustrations. It may be objected to this line of argument, that in practice, our mortality, or interest rate, or both, are already loaded for fluctuations or contingencies in respect to the tabular assumptions; therefore, R is not a function of ϕ. I answer that, in America at least, this so-called loading is rather the fixing of a safe limit within which a normal experience, according to observed facts, may be expected to fall, than an attempted provision against abnormal conditions. But, apart from this, I do not conceive that any company, in adding its loading, ignores the protection which, under the contract, it offers against the possible failure of tabular assumptions. Like the floater of the fire underwriter, it is intended to apply specifically wherever needed. If a life company could be operated without expense of any kind, I imagine actuaries would agree that the office premium, however loaded, was the proper test of the company's condition.

Unless recognized by special stipulations in the contract or the charter, no charmed circle surrounds a net premium, setting it apart from the real office premium; the distinction is one of convenience and utility, rather than of necessity, and this is my point.

I now come to consider the limitations of a net valuation method in the determination of divisible surplus and surrender-values. Does it furnish an equitable basis for the individual policies? What is equity? Again we must refer to the law rather than the actuary. Equity may be consistent with any form of contract whatever, under which the members intelligently agree to enter on equal terms, in harmony with the legitimate purposes of insurance. The annuity, which profits the long-liver, is as equitable as the insurance which profits the short-liver, the mortuary bonus as the annual dividend. The unqualified lapse would be as equitable as the surrender-value, if intelligently agreed to. Its inequity comes from the harshness of results that were not anticipated and understood. In other words, in order to define equity, as applied to insurance, we must refer to the contract itself and its purpose. It cannot mean an equalization of payments. Inequality of contributions is the foundation of insurance. We mean by equity, an apportionment of cost and benefit in harmony with our knowledge of the risk, and with the obligations assumed. The claims of the company, as a whole, are superior to those of the individual members, as before remarked. If found to be insolvent,

every man's claim must yield to the equal rights of all. If over-payments are needed for the company's protection, or to properly carry out the objects of its creation, their return may be forborne, or even dispensed with. Much has been claimed for net valuations as a correct measure of the equities of the members. But while it undertakes to apportion the cost to the risk, it takes limited note of the obligations assumed. The paramount obligation to protect the company requires that the series summed up, as Σ, be ample enough to maintain the law of average on which it rests, and to reduce E to a value consistent with the best interests of the members. (Of course, I am discussing companies where mutuality is a feature.) I conceive that excessive and unnecessary expenditures are as much a violation of the implied undertaking of a mutual company, as an inequitable apportionment of dividends. This paramount obligation also requires that this average relation shall not be destroyed by the reduction of ϕ or the increase of $\frac{d_{x+n}}{l_{x+n}}$ through withdrawals. No matter what special stipulations may be made regarding withdrawals, such stipulations are equitably unsound if they conflict with the implied obligations of the company to its members, as a whole, even though they be legally enforced. My point is, as before, that a net valuation can, of itself, determine equities only when, without serious error, E and ϕ can be eliminated from equation (2), and when $\frac{d}{l}$, on which the remaining factors depend, is not seriously disturbed.

Now, what are the limitations within which a net valuation renders efficient service and its real superiority exists? A brief examination of the deficiencies of the gross-valuation method will make these more patent. Reverting once more to equation (2), it consists of two classes of factors—the one tabular, the other arbitrary. A gross valuation, for reasons before stated, demonstrates the correctness or sufficiency of neither apart from the other. A deficiency of P or ϕ might be offset by an excess of the other, or by a deficiency of E. Our equation, moreover, only holds true on the assumption that deficiencies, in any of the terms, will be offset by an excess in others. We are dealing with a question of futures, where the correctness and sufficiency of our constituent elements, as well as of our equation as a whole, are problematical, and are objects of inquiry. More than this, our contract is one-sided. It is compulsory on the part of the insurer, and voluntary on the part of the insured. The future income on which we count is not obligatory. Our assumptions in regard to it we are morally certain will not be realized. Lapses and withdrawals are sure to come; neither comply with any regular law. We know that none of our tabular or arbitrary assumptions will prove more than approximations to our actual facts. While it is mathematically true that, by compounding and multiplying our sources of error, we may measurably offset the one against the other, and so reduce our possible error as a function of the aggregate, it is none the less true that each individual error that can be eliminated helps to reduce the probable error of the whole, and every analysis of our equation, which enables us to eliminate errors in its constituents, insures more accurate and reliable results. A net valuation analyzes

our equation of theoretical ultimate solvency, and enables us to more accurately determine the real values of our constituent factors.

The practical defects of the gross valuation theory find an exaggerated illustration in what we know as assessment companies in America, companies in which stipulated premiums are either replaced or supplemented by power to assess. Theoretically, such companies can never be insolvent. Their aggregate future assessments can never be less than the sums insured. Practically, these companies become insolvent the moment their assessments reach a point where the desirable members, as a body, refuse to pay. Deficiency of ready cash in the treasury induces present bankruptcy and withdrawals of good lives render both the present value of the insurances and the expenses excessive, as compared with the possible income.

The investigation aimed at through a valuation of the company's resources and obligations is not confined to its ultimate theoretical outcome, but applies to every intermediate stage in the company's history, to temporary bankruptcy or embarrassment, to those results that are likely to arise through lapses and withdrawals, through fluctuations of mortality, and through imprudent dividends and surrenders. The business of a life company combines the features of a bank and a trust company with those of an insurance office. We can no more properly ignore the banking or commercial element, and the conditions which they exact, than the distinctively insurance element. For all these reasons, that analysis which a net valuation provides, if not actually essential to sound management, is, within proper limits, a most important aid and guide. He would be a slovenly engineer, who, having computed the power and resistance of his machine, on theoretical assumptions, should ignore these in judging its workings because he had added a liberal safety coefficient. Negative values, however treated, are evidence that a gross valuation may need to be supplemented by such an analysis as will co-ordinate the results with the hypothetical assumptions on which our scheme was framed, which is another way of saying that the net valuation furnishes a needed means of finding out how far the fundamental conditions assumed have been realized. Knowing this, we are in better condition to gauge the future.

A net valuation tells us how closely our tabular assumptions have been realized. It co-ordinates P_x and A_{x+n} and ϕ_x and E, both as to the past and the future. It is thus in line with the recognized rules of scientific inductive inquiry. It gives us a function V derived from these tabular assumptions, which may be used like the sailor's log line as a determinant, not of the true place of his ship, but of how she has been sailing, which must be corrected for leeway and currents and slip. Because only a time-sight can accurately place the ship, shall we discard the dead-reckoning and the log? If we know that the loading is abundant to care for incidentals and expenses, our net valuation can assure both present and prospective solvency. If the safety margin be narrowed, a net valuation by showing the drift in the past may tell us what demands may be looked for in the future. If new business is being purchased, or heavy outlays of any kind indulged, it is a beacon to mark the danger shoals. If the general wisdom or prudence of the management be in issue, it furnishes an important element that should be weighed. If the reliance that can

be placed on our original assumptions, or the errors involved in them are to be fairly judged, we must have recourse to this mode of valuation. When we know what allowance should be made for the leeway and currents and slip, the practical advantages in its application are great.

I take first its application for Governmental purposes. When confined to the object originally intended, which was simply a check on imprudent management, it sufficiently answered the purpose at the time in America. The rates were understood to be adequate, and the guaranty capital required by law to be sufficient to tide over the cost of new business. Evidence of faithful adherence to the fundamental conditions of the contract was what the Government sought, and this it furnished. What has grown out of this? To-day the officials of more than a score of States are occupied with the sworn returns of companies in the form of prescribed balance sheets for public information, in which the chief liability is represented as a prescribed net reserve, offset by cash assets in hand, and the difference is formulated as "divisible surplus above all liabilities", or "surplus as to policyholders", or even brought down as a separate unbalanced item after the balance has been struck, lacking which under our laws a company is technically insolvent and must suspend new business. This statement is accepted by the public as a complete financial exhibit of the company's condition. Its strength, its standing, and its progress, both of itself and in comparison with its competitors, are chiefly measured by the relation of these three elements—liabilities, capital, surplus. Every expert knows that the attempt to divide this surplus might bring the company under the ban of a State official when its capital is trenched on; that by reason of low rates or paid-up policies, it may not have a dollar to spare, or by reason of high rates or commuted commissions all and more may be dispensed with. But even experts cannot resist the contagious influence of popular opinion backed by authority. A useful guide for the departments has been turned into a Procrustean bed on which all must lie. Granting that we may assume without serious error the equality of P_x, &c., and A_{x+n} at every stage of the game, so that withdrawals would merely result in cancellations of these factors, from both sides of the equation, ϕ and E are not so related. The latter involves a constant expense that must be maintained while the company lasts; and if the cost of new business, too, be considered, it may represent the value of a decreasing annuity. So that even in theory the gross valuation becomes defective the moment these two elements are admitted. In practice this point receives greatly added emphasis from the influence of selection, which tends to render

$$P_x(1+a_{x+n}) < A_{x+n}$$

The moment public confidence in a life office is impaired for any reason, as is well known, this threatened inequality becomes a menace to solvency; and formula (2) no longer represents the expected future. Impending financial weakness or embarrassment is the chief disturber of public confidence, and the net valuation furnishes the best test of its approach. This, to my mind, is the great advantage of this method for Governmental purposes when rightly employed. Industrial insurance is a business of commuted commissions and enormous initial

lapses. The theory on which it proceeds is the replacement of these lapses at heavy initial cost until a solidified debit has been created. Years are required before this debit can repay the outlay. Our legislation in America takes no note of these facts, although the premiums have been correspondingly loaded. The company must put up each year a fictitious reserve which it cannot earn, which is contrary to the theory of the business, and which is provided against in the loading on its future premiums. The attempt to start a new company there is rendered almost suicidal under existing conditions. Several such have been forced to the wall. This is but an exaggeration of conditions which prevail whenever commissions are commuted, or the necessary cost of new business exceeds the marginal provisions. A true theory of the business requires that the company should borrow from the future if needed to maintain its membership. This theory should be recognized in the net valuation. The company advances in part for the entrant the cost of procuring him. It may be proper when dealing with individual policies, but it is not necessary to assume that the company must be protected by an excess of premium equal to the current cost of insurance. In industrial insurance no such limitation is or can be imposed. The cost of a solidified debit in America is popularly reckoned at a hundred times, or two years', purchase. The theory is that the profit from the policies in mass will in the end repay the outlay. I know no reason why the doctrine should be inapplicable to ordinary insurance so long as the individual policyholder does not himself profit by the lapse. This suggests an extension of the plans proposed by Dr. Sprague and Mr. Homans at the last meeting of this society for allowing for the expenses of new business. Mr. Homans suggested that the usual method of net valuation be applied only after the first year. According to Mr. Homans, the logical reserve at the end of the first year, which should be treated as the real reserve would be, accenting the terms where experience is substituted for theoretical assumptions, and making K the sum to be deducted for expenses.

$$\frac{l_x}{l^1_{x+1}}(\mathrm{P}_x-\mathrm{K})(1+i)-\frac{d^1{}_x}{l^1_{x+1}}={}_1\mathrm{V}^1{}_x$$

V^1 might in this case be negative and would be dropped for the first year, but would reappear in the second as a substitute for K in computing ${}_2\mathrm{V}^1{}_x$.

If such a modification of the net valuation method could be employed, and the American balance sheet could be reformulated to eliminate the fictitious importance now attached to the net reserve, I fail to see why, for ordinary Governmental purposes, it would not continue to be the best as it is the simplest and most commercial method of valuation. But I pre-suppose that any official judgment predicated on its results would be supplemented when needed by other tests, and that our laws should no longer seem to make it a complete test of solvency, and say, in effect, of a company unable to comply, that it is sick and likely to die.

The necessary limits of my article prohibit more than a brief discussion of the question which is, after all, of the greatest interest in this connection, namely, the real relations of the net valuation to

the equities of the individual members. As has been said, it cannot of itself fix these equities. But when a court seeks to determine equities, chief among its inquiries are the processes employed in establishing the relations of the parties. There is a strong presumption in favour of these processes. When the goods of the manufacturer are burned, the cost of the raw materials and the labour expended in transforming them into the finished product become pertinent subjects of inquiry, and in the absence of a definite market price may afford the best measure of their value. There is no market price for life-insurance equities. The theory on which the cost of insurance is determined is in universal use. There is no other well-defined function which replaces the net premium as a general basis from which to measure equities. There is no other function which deals so directly with the original assumptions of the business. There is none to which a court would so naturally turn in a contract whose character forbids the application of ordinary commercial rules. There is no other function which analyzes so thoroughly the ordinary business features of the contract. The reserve which it furnishes differentiates in a measure the banking elements of the business. However mixed with error, there is for important purposes a certain measure of truth in our popular American conception of the net reserve as the banking feature of insurance. American fire underwriters are accustomed to use what they call a standard risk with an established value. They fix their rates according to deviations from this standard measure. In a somewhat similar way a net valuation furnishes a natural standard to which to apply the deviations which equity may require. A bank or mercantile corporation has a fixed commercial rule for determining equities. Not so the life company. No two actuaries are likely to agree on the equitable interests of the policyholders, nor on the rules which should be applied under different conditions. No two courts are likely to agree. The complicated elements involved take the question out of the range of pure mathematics, and resolve it into a matter of judgment for the actuary or the court. But business necessities demand fixed rules which shall be of general application, and remove the question beyond the reach of mere caprice. The net valuation furnishes a natural foundation for fixed rules of general application. We must have a definite starting point in every scientific mensuration. We should have as a starting point a function most nearly corresponding with our object in view. The value of the metric system is in the co-ordination of all its parts starting from a measured arc. The abuse of the net-valuation method has come from ignoring other elements and making it the rule rather than the foundation.

Governmental attempts to prescribe equities must always be an abuse of power and an act of harsh injustice, unless the law is content with simply establishing a foundation rather than a rule, a minimum limit with which any properly managed company can comply, and this Governmental limit competition in America has rendered superfluous.

No two companies are alike in their conditions, nor are the conditions of the same company alike at all times. Apart from fixed contract rights, the equitable relations of the members are an unstable quantity. The equitable relations of the retirant to his fellow members are one thing in a prosperous company; they may be quite another in a company where every withdrawal reduces the average vitality of

those that remain. The hypothetical premium plan of valuation emphasizes the rights of the individual retirant by exhibiting the re-insurance value of his policy. An ordinary net premium valuation, with allowance for inital cost of insurance and the contributing value of his policy to the general claims and expenses, may emphasize the rights of his fellow members against the retirant. Limited payment contracts may produce a wholly fictitious reserve under the application of the same net method, whose results are entirely consistent when applied to continued premium contracts. In America every form of policy which actuarial ingenuity can devise is competing for popularity. No general laws can formulate the equities of such a business, however ingenious the lawmaker. As well might we undertake to prescribe by statute the law which applies to every issue brought before our courts, and relieve our Judges of their functions. In America, as well as Great Britain, the common law is the foundation of our jurisprudence. Its strength is its flexibility and power of adaptation to each individual case, unhampered by rigid enactments. It is efficient because it is a growth, built up of individual cases correlated into general principles. As every lawyer knows, no machine-made code could fill its place. Such an attempted substitution would subvert justice. In the same way, no scheme of legislation, however able, can supplant the functions of the actuary as the administrator of justice among the members of his own company, under that common law of insurance which is an outgrowth of its fundamental principles. The attempt to accomplish this through the net valuation system is, in the minds of many American actuaries, the most serious defect of our Governmental system.

Here I must close my discussion. The topic is too large for a consideration of more than a few of its more prominent phases. I have sought to show that the true limitation of the net valuation system consists in its application to determine how far the fundamental conditions governing the business have been carried out. When this is known, it remains for the expert to apply the knowledge in the determination of questions involving solvency or equity, according to the special case in hand. There is no necessary conflict between the gross and the net valuation systems. Each has its legitimate use, and each may be abused. But when his valuation is complete, the actuary may still find himself only on the threshold of his inquiry regarding the true condition of his company. In its final analysis every business venture resolves itself into a question of mathematical probabilities, but with so much of the data and the formulas unknown or complicated that its solution as a mere mathematical proposition is impossible. We must supplement our mathematics with practical judgment born of experience. Life insurance is no exception. It differs from ordinary business, chiefly because the scope of the mathematician is broader. It has long been an accepted principle in Great Britain, that the true standing of a company can only be judged by a comparison of the various features of its returns. American actuaries recognize the same truth.

If I am right, in these conclusions, then all who contend for any form of valuation to the necessary exclusion of others are wrong. Each form has its special use in which it may be superior to the rest, but the fundamental form to which all others are subservient is that form

of gross valuation which alone can determine the question of theoretical ultimate solvency. The practical mathematics of life insurance can never be wholly divorced from its business features, nor the questions which arise in it be dealt with on purely mathematical theories. The engineer must compute his stresses and resistances by mechanical formulas, but when all is done, his coefficients of friction and safety must be matters of judgment. So it is in insurance.

Here I rest, purposely stopping short of those detailed practical applications which, I believe, were in the mind of Mr. Homans. My topic was originally his, and my treatment of it has been inspired rather by a wish to honour his memory than to seem to usurp his place.

Discussion.

The President, in inviting discussion, said the subject formed a very ancient battle-ground, and was one of extreme practical importance.

Mr. Philip L. Newman (York) said that the legal limitations with regard to net valuations, experienced in the United States, were not operative in the United Kingdom. Here, we had not to consider the question of individual equity, to which so much prominence had been given in Mr. Nichols's paper. In the United Kingdom a net valuation was not regarded as other than a convenient method of ascertaining the divisible surplus; and, with low rates of interest and a stringent table of mortality, it was considered the best test of securing the stability of the Company. That was the reason why nearly all the British offices had net valuations. The individual equity of the policyholder did not come in at all till the surrender-value had to be considered. They were not limited by the law as to what proportion should be given of the reserve, and there was no necessity for them to regard the individual rights of the policyholders in connection with the collective rights under the valuation. Mr. Nichols, in his paper, appeared to the speaker as having started out to curse, and remained to bless. The arguments against the net valuation were not real arguments that they should throw it over, and although Mr. Nichols had said that the gross valuation could alone determine the question of theoretical ultimate solvency, he had not proposed in any part of his paper that they should adopt in practice a gross valuation. The statement in the paper that the industrial business in America should not be regarded as under the same rules as ordinary life assurance was a very important one, and he was sorry the contributor had not given more space to the discussion of the subject. As to the Courts of Law determining the question of equity, he (the speaker) would rather say that they, the actuaries, really determined the equity, because, as a rule, the Courts of Law came to the actuaries to know what the equities of the question were.

Mr. Emory McClintock (America), in rising to make a personal explanation, said that Mr. Nichols had correctly quoted some remarks made by him (the speaker) some thirty years ago. As those remarks were quoted, he did not think that anybody could misunderstand the way in which they were made. But, inasmuch as the quotation ranked him very strongly against the system of net valuations as a test of solvency by legal process, he wished to add, on the other hand, that he fully agreed with the remarks of the last speaker as to the advantage of net valuations for the purpose of providing for equalized bonuses in the future, and that in practice he had never recommended to a company, or used himself, anything but a net valuation.

Mr. George King (London) said that it was difficult in a few words to say exactly what one would like. He ventured to point out that the question was more important in countries that were not so free in matters of insurance legislation as, fortunately, the United Kingdom was. They all agreed that a net premium valuation, for a going concern distributing profit, was by far the best plan, but he thought they would also agree that to insist upon a net premium valuation as a test of solvency it was a very great mistake. A company might be absolutely solvent, and might be doing a great deal of good work in the world, without attaining to the full standard of a net premium valuation. He (Mr. King) could not help thinking that a net premium valuation was desirable, but it should not be insisted upon as a test of solvency. This might do an immense amount of mischief, and inflict a vast amount of cruelty upon the policyholders of the company. It was not right to force liquidation upon a company simply because it did not come up to the test of theoretical perfection, and that was the view which should go forth authoritatively from the meeting hall of the Congress. Advocates of net valuations must not lay them down as a test of legal solvency.

The Influence on the Prosperity of Life Offices, of Valuations, taking account of Expenses of Management. By E. W. Scott, *one of the Managers of the Algemeene Maatschappij van Levensverzekering en Lijfrente at Amsterdam, Associate of the Institute of Actuaries, Member of the Actuarial Society of America, Corresponding Member of the Institut des Actuaires Francais.*

It is not an easy task to the manager of a life company, not being an actuary, to appreciate at once the exact value of any special condition asked by the public, or even prescribed by some Government, and to take care that the profits, resulting from profitable assurances, should not be lost by onerous conditions of others.

In general, for the calculation of the amount of profits realized, no invariable rules can be given; each company has its own peculiarities, its own exigencies, its own organization, its own conditions of assurance, which must be taken into account, which have their own particular value, and which cannot be neglected in this calculation. Some countries prescribe by law the net reserve method to be applied, not only to the valuation of the reserve, but also to calculating the surrender-values to be granted to the public; some of them also prescribe distinct modes of investments of the funds of the company; it is clear that such prescriptions must necessarily exert influence upon the calculation of the profits realized.

It might be considered equitable that no others than actuaries should be placed at the head of life offices; and indeed, this could be thought recommendable if every country had showed sufficient interest in the development of actuarial science, by giving the opportunity of training actuaries, *e.g.*, after the model of the British Institute. But such a general conclusion cannot properly be come to, so long as this is not the case; there are many countries, where the main theoretical knowledge of mathematics only, is considered to be sufficient for the purpose, and where, consequently, but little value, if any, is attached to the commercial, financial, judicial, administrative parts of the profession. I presume that here lies the principal cause of the singular legal prescriptions, *given* by some Governments, *proposed* by others, which we witness now-a-days; prescriptions based on the advices of such mathematicians, acting as actuaries, without being so, and through which prescriptions very much prejudice is caused to the business—if they don't give place to undesirable and improper proceedings, tending to cheat such prescriptions, or to neutralize their effects.

Although these views will not contain anything new, I thought it might be of some interest to managers of life offices, not being actuaries, to have before them, in simple tables, without calculations of higher order, the results to which the theories of such unskilled advisers may lead, in order to be able to judge in what measure they are consistent with the conditions under which business has to be transacted in our days.

For this purpose I have prepared some tables, after different methods, and relating to some groups of assurances; it should ask too much room to have these tables inserted here, so I am only able to give a description of the results come to. I took into account the same number of claims, lapses, and surrenders, also the same rate of interest at each of these methods, and I will make every effort to describe the different methods adopted, in such a way that any actuary will be able to control my calculations. In this paper I will only refer to the following groups:—

A	10,000	assurances;	whole life;	age	25	years		
B	10,000	„	„	„	35	„		
C	10,000	„	„	„	45	„		
D	10,000	„	endowment;	„	30	„	duration,	30 years
E	10,000	„	„	„	25	„	„	20 „
F	10,000	„	„	„	30	„	„	15 „

I supposed that all the assurances of each group have been effected to the same number and the same amount. The mortality prevailing at the end of each year, after Dr. Sprague's selected tables. An interest of 4 per-cent has been supposed to be received on the balance in cash at the end of the year. I further supposed that, from the original number of assurances, 4 per-cent lapse by death, surrender and lapse together, every group thus being extinguished after 25 years.

The premiums and office-values being calculated after H^M (5) Table, a smaller number of deaths is, however, supposed to occur in the first five years. Consequently, profit is coming forth in these five years, the following years bringing neither profit nor loss from this source.

If the premiums and office-values are calculated after the H^M Table, my suggestions give also a smaller number of deaths during the first years, but in later years this number is higher. Consequently, this item will yield profit in the first years and loss in later years.

The amount of profit realized by the actual mortality against the supposed, varies, as well with this actual mortality, as with the table of mortality adopted at the calculations, and, of course, with the table adopted. It is, therefore, of the highest interest to adopt the same table at the valuation which has served at the calculation of the premiums.

Another source of profit lies in the rate of interest earned; if the interest realized is higher than that adopted at my calculations, *i.e.*, 4 per-cent, the difference between this percentage and the actually realized one will come forth as profit.

It is obvious that no reserve can be formed on policies, the premiums on which are not sufficient to cover the costs of acquisition and the risk run; such policies turn into losses when lapsed.

If an office is compelled to grant a surrender-value to such policies, the loss will become heavier.

If, on the contrary, a certain amount of reserve is at hand on a lapsed or surrendered policy, profit will be gained by the office to the extent of the part retained.

It is a prudent course not to be too quick in dividing profits; perhaps it is the fear for this that induced some Governments, on the advice of their mathematicians, to prescribe the valuation of the reserve after the net premium method, and such with the view to be quite safe accordingly. But they forget altogether that such an amount of reserve cannot, in reality, exist; the only reason for raising a reserve is to enable an office to meet its liabilities in the future; it is no use to increase it beyond the reasonable limits; on the contrary, it is against the welfare of the company, as it gives too high surrender-values.

There are even such Governments as do prescribe the amount of surrender-value to be paid to the assured who are willing to leave an office, this amount being generally a certain part of the reserve calculated by the net premium reserve method. They thus cause the offices important losses. Safety does not involve such unreasonable terms.

My calculations have led me to the conviction that the net premium method can only be adopted by old-fashioned offices, but is quite an impossible system in the present state of business and the modern exigencies of the lives; if the premiums are not exceedingly high, even surrender, in the first years of an assurance, turns into a loss, and this loss is not counterbalanced by the profits resulting from surrendered policies of longer duration; this loss has thus to be regained from other sources.

My opinion is, that the present state of the competition, the present circumstances under which the companies have to work, wholly justify them to pay surrender-values, calculated after the gross premium method, taking the negative reserves as 0.

Acting in this way, the negative reserves come forth as a loss, causing no profit to be declared before this loss will be covered by profits from other sources, and before the reserve, thus calculated, will include an amount sufficient to meet the future expenses on the existing policies.

No surrender can ever turn into a loss to the office, if the reserve is thus calculated, and if the surrender-value is, in this measure, dependent on the office-value. And the skilled actuary will quite be up to the task to value what amount has to be retained for future expenses; mere mathematicians can have no solid opinion thereon—actuaries proper, can.

It is obvious, from what precedes, that at the valuation of the reserve, not only the amount of the loading must be taken into account, but also the purpose for which every part of it is charged. If that part of the loading which is charged for profits should be left out of account, the amount received for profits should, of course, come forward, as such, yearly. In considering the part destined for expenses, special attention must be paid to the periods at which these expenses are supposed to fall due; a different course has to be adopted in the case of a company whose initial expenses are slight, whilst its

renewal expenses are high, as compared to another company disbursing much money for securing new business, but being very parsimonious in renewal expenses. The first one will have to disburse in the future much more on its stock of assurances than the latter.

The table of mortality, on which the valuation of the reserve is based, must be the same after which the premium tables are calculated; a sufficient loading must be added to the net premiums; the rate of interest at which the premiums are calculated must be somewhat lower, as the rate realized, in fact, and the conditions under which surrenders are granted, must be such that the company can never be obliged to pay more than it can reasonably have in cash for that.

The conditions of assurance and the premiums, as well as the particular conditions, under which a company is working, should be taken into account at the valuation of the reserve. One of these elements being left out of account, serious disproportions will arise, leading to great difficulties.

I know that many mathematicians are of opinion that the reserve should always be valued on net premiums, because this is the safest course, and that, in consequence, the expenses must be narrowly limited; but anyone who has some experience of the actual conditions under which business has to be transacted now-a-days, must know that it is nearly impossible to secure a reasonable development of the business, unless the mediums, through whom it comes to the companies, are fairly paid; the exigencies of the line, the management, the control—everything connected with the administration of a company—involve a higher percentage of expenses, generally spoken, than in former times. Such mathematicians do neither keep in mind that the net premium reserve method leads to high surrender-values, for the first years higher than can fairly be in cash, and after a longer period to inequitable low surrender-values.

In order to demonstrate this as clearly as possible, I elaborated some tables, by means of which the position of three different existing strong companies is described; one of them established at the beginning, the second one about the middle, and the third one in the last quarter of this century. I suggested, of course, the same groups of assurances, the same dying-out, and the same surrenders and lapses in the case of each of the three.

As to the first company, it must be remarked, that at the beginning of this century premiums were very high, and the conditions of assurance very conservative and restrictive; the interests of the assured were not much thought of at the time. Canvassing was wholly unknown; on the contrary, no effort was made to induce the public to take out a policy; they were expected to come to the companies out of their own impulse; the idea of insuring human life was not at all propagated. Commission to agents was entirely out of the question; the managers generally received, as a compensation for their work, a trifling part of the premiums, out of which they had to provide for all the other expenses of the company. In the old premium tables no rates are to be found in the case of groups D—F; I, therefore, was obliged to limit my calculations to the groups A—C.

The premium quoted in the premium tables (without profits) of this company amounted to—for group A, 2·6 per-cent; for group B, 3·6 per-cent; for group C, 4·6 per-cent of the amount assured. In

comparing these premiums with the net premiums of the H^M 3·5 per-cent Table, a loading of respectively 70 per-cent, 73 per-cent, and 54 per-cent of the net premiums comes to light.

The second company referred to published tables with and without profits to the following extent:—

Group	A	1·829	per-cent without;	2·14	per-cent with profits.
„	B	2·45	„	2·805	„
„	C	3·469	„	3·867	„
„	D	2·956	„	3·311	„
„	E	4·418	„	4·772	„
„	F	6·203	„	6·575	„

These premiums are based on the H^M 3·5 per-cent Table, and much lower than those of the first-named company. They contain, besides a loading for profits only on the highest premiums, a certain loading for expenses of exploitation, and 6 per-cent for renewal expenses. For this reason this company based the office-value on the H^M 3·5 per-cent Table, calculated with the gross premiums without profits, diminished with 6 per-cent. From this office-value, 75 per-cent will be the surrender-value in the third year; for every year more, 1 per-cent more, to the limit of the total reserve, calculated with gross premiums. This course is in close harmony with its base, and does neither give any loss nor an exaggerated profit in the case of surrender-values.

The third company, the youngest, publishes also premiums with and without profits, at different rates, namely:

Group	A	1·80	per-cent without;	2·11	per-cent with profits.
„	B	2·36	„	2·73	„
„	C	3·44	„	3·85	„
„	D	2·70	„	3·03	„
„	E	4·11	„	4·47	„
„	F	5·73	„	6·10	„

The comparison between these premiums and those of the second company shows but little difference in the case of the groups A—C, but a rather important one for the groups D—F. The second company seems to have adopted the view, that the rate of mortality should be the same for the groups A—C and D—F, whilst the third company is probably of opinion that this rate is more favourable for the groups D—F than it is for the groups A—C. The latter company uses several tables of mortality and calculates its reserve from the difference between the value of the gross premium, without profits, and the value of the insurance, increased with such an amount for future expenses as is thought safe and desirable and consistent with a moderate distribution of profits, and with the aim in view, to approach gradually to the reserve, calculated with net premiums. Its surrender-values amount to 75 per-cent of the office-values in cash, with the exception that such assurances (endowments, &c.) as are very near to their term, are surrendered against payment of the present value of the amount assured, after deducting the present value of the gross premiums, which are left to be paid to the natural end of the assurance.

Let us now examine to what extent the influence of a valuation method more or less in accordance with the particular position of the company concerned, will be perceptible.

Of course, no profit can be distributed unless the reserve, as calculated after the adopted method, be in cash.

The premiums are supposed to be received, and the expenses to be paid at the beginning of the year; the interest to be 4 per-cent; the claims and surrenders to be payable at the end of the year, and the amount in cash, exceeding the calculated reserve at the end of the year representing the profits, ready to be distributed. Where no profit exists, the amount in cash is consequently less than the reserve calculated.

In the case of the first-named office, there is no difference between the supposition of each of the groups A—C, taking out a policy at once, or an equal amount of policies being taken out yearly.

Profits will be gained from the very first year, and will increase yearly, if the percentage disbursed for expenses be under the loading, and if the reserve be calculated after the H^M 3·5 per-cent Table and the net premium method, and such, notwithstanding the mortality, will be greater than that after the H^M Table. Profits can be declared every year, and such, notwithstanding the second element of profit falls through, from the sixth year, it being converted into loss by the supposed claims.

This is caused as well by the high premiums as by the fact that the method of valuation is entirely in conformity with the particular position of the company.

If this company allows a part of the reserve as surrender-value, the profit will be so much the less, but increases afterwards. If it takes up the competition with other companies, its expenses will be heavier on its new business, but a decrease of the proportional expenses on the long run will no doubt occur. The maintenance of its high premiums will allow it to maintain also the net method after the H^M 3·5 per-cent Table.

If this company had gone into the business on the actual lines, from its beginning, it should have undergone the same experience as others, and even its high premiums should not have allowed it to pay all the initial expenses for securing new business, out of the loading on the first year's premium, but had to be divided over the whole duration of the policy.

The net method has its origin in the by-gone days, that business was much easier to be secured than now-a-days; it is based on situations no more existing. Its promoters wholly lose out of sight the enormous efforts necessary for the development of the business.

There are many companies whose development has been stopped by the misunderstanding of this most important item and by the want of perspicacity in judging the facts as they produce themselves. Theory alone, which does not take into account the claims of practical life, never did much good.

The reserve is the difference between the present value of the future assets and liabilities of the company. A change in the date at which these fall due involves a change in their present value.

If through this calculation the reserve falls under zero, it is a prudent and wise course not to deduct this negative value, but to throw

it out as *nil*, and not to declare any profit, unless the reserve is in conformity with the particular position of the company, but it is useless, without good sense, and against the prosperity of the office, to burden it unreasonably, and to throw thus an unfavourable light on its position. The companies working on the plan of the first-named company, have realized such enormous profits that other offices could charge lower premiums and pay more commission to their agents. In doing this they brought the blessings of life assurance to a larger public and sensibly promoted its propagation.

In the case of the second-named company, it is supposed that each of the groups A—F contracts an assurance, with profits and without profits, per head. If 5 per-cent of the new capital assured is laid out in initial expenses and 6 per-cent of the premiums received in renewal expenses, and if the reserve and the surrender-values are calculated after the method adopted for the calculation of its premiums on the H^M 3·5 per-cent Table, it will be seen that the reserve is present from the third year, notwithstanding the premiums are lower than those of the first-named company and the initial expenses higher than was provided for in the loading.

The elements of profit don't work so regularly here in the first three years as in the case of the first-named company. This is caused by the fact that the loading is supposed to be under the 5 per-cent required for expenses of exploitation. However, this difference is less in the first three years than the profit from the mortality. Profit is regularly realized from the third year, notwithstanding it is supposed also that the claims from the sixth year will be higher than the mortality table indicates.

In the case of a Government prescribing such a company to calculate its reserves and to pay surrender-values after the net method, no reserve could be formed, and consequently no profit could be gained before the twelfth year.

The cause of this fact is not only to be sought in the higher amount of the reserve, but also in the lapses and surrenders of the first years, where are as many losses, as calculated after this method. The profits resulting from the method adopted by this company are here converted into elements of losses, whilst the greater profits in later years will probably not produce themselves, because they involve too much prejudice to the assured.

The difference between the two methods comes the stronger to light under the supposition that each year the same number of assurances is effected, and will increase in proportion to the number of assurances being greater, or to the expenses for new business being heavier.

If a Government should prescribe such a company to invest its money in securities yielding no more than 3·5 per-cent, the third element of profit should also cease to be one and no reserve could be formed, even much later than the twelfth year.

Such Governmental prescriptions can only lead to increasing the rates of premiums, and thus act directly against the interest of the public. No more security is given by them. A great decrease of profits results from them; the charges to the assured grow higher. Where is the benefit of such prescriptions, which cannot even be defended on reasons of common sense?

A company's growth will be disturbed in the case of a valuation method not being appropriated to the organization of the company, and such will be so much more the case where a company's tables are low. For instance, if the third-named company, who works with good financial results, should be compelled to make its calculations after the base of the second one, the absurd result would be come to that its surrenders would be greater and its reserves higher than those of the second-named company, which works at so much higher rates, and which consequently has cashed so much more premiums.

From all that precedes it may be clear that it is by far preferable to adopt at the valuation of the reserve the same table of mortality and the same rate of interest adopted at the construction of the premium tables, and to leave nothing out of account by the one what has served by the other. It is only fair to keep in eye the situation of the company concerned and to avoid mere theoretical suggestions not in conformity with its particular position.

I am convinced that it will be perfectly clear to the impartial peruser that the net premium reserve method can only be adopted by old companies, charging high premiums. I express a further hope that this perusal will confirm the opinion that other safe and equitable courses can be adopted which allow companies to extend their business and thus to promote the use of life offices by the public.

I most sincerely wish that those gentlemen who act as advisers of their Governments may be convinced, through my calculations, that and why it is unjustified to prescribe distinct methods of calculating surrender-values, and to order the investment of funds in fixed securities, and that they thus may be induced to do everything in their power to have such prescriptions withdrawn, where they exist. They are useless; they act against the interests both of the assured and the public, and check the development and growth of the business.

And such can never be the intention of any Government.

Life Assurance Legislation in Australasia.

By Richard Teece, F.I.A.

The Australasian Colonies embrace the mainland of Australia (comprising the colonies of New South Wales, Victoria, Queensland, South Australia, and West Australia), the island of Tasmania, situated about 150 miles to the south, and the islands of New Zealand, about 1,200 miles to the south-east. The total area of the colonies is 3,075,238 square miles, or about two-fifths of the area of the British Dominions, and their white population about 4¼ millions. The existing assurances (excluding bonus additions), on the lives embraced in this scanty population, scattered over this enormous area, are about £83,000,000 of sums assured, or about £19 per head of the population. These figures indicate that the life assurance interest is one of considerable magnitude, and sufficient to induce the legislatures of the various colonies to frame enactments for its proper conduct and due protection. To what extent these enactments have served the purpose for which they were intended will appear as I proceed. My present purpose is not to enter into a criticism of them, but rather to fill the position of their historian, in the hope that I may be able to furnish, if not to my British and American brethren, at least to those distinguished European members of the Congress who have possibly not busied themselves with the progress of insurance events in this remote corner of the earth, something in the way of information. All the colonies named, with the exception of New South Wales (the mother of the tribe), and Queensland, have passed one or more comprehensive Acts of Parliament dealing with life assurance offices. New South Wales has legislated only on three points, namely, the protection of policies against the claims of creditors, the treatment of lost policies, and the rights of married women. The Queensland legislation is a mere travesty. Reference to both of these will be made in the proper place. The Acts of the other colonies have all taken as their starting point the English Act of 1870. This is the proper place, therefore, to express the acknowledgments of the life offices of these colonies for the example given us by this Act. I hope I shall not be accused of national prejudice when I say that I think we have, in some directions, improved on the Act of 1870.

For purposes of reference, I give below a list of all the measures dealing with the subject passed by all the colonies I have named.

In the majority of cases where more than one Act has been passed by one colony, the later measures have been introduced for the purpose of amending the earlier ones, in some points upon which the courts of law had given decisions repugnant to the intention of the legislatures.

New South Wales	1862 — 26 Victoria, No. 13. Dealing only with the protection of policies, and the rights of married women.
	1895 — 59 Victoria, No. 13. Dealing with lost policies.
Victoria	1873 — 37 Victoria, No. 474.
	1889 — 53 „ „ 1027. Amending Act.
	1890 — 54 Victoria, No. 1074. Consolidation Act.
Queensland	1879 — 43 Victoria, No. 8.
South Australia	1882 — 45 & 46 Victoria, No. 277.
	1885 — 48 & 49 „ „ 350. Amending Act.
	1887 — 50 & 51 Victoria, No. 417. Repealing Act of 1885, and Amending Act of 1882.
West Australia	1889 — 53 Victoria, No. 12.
New Zealand...	1873 — 37 „ „ 18.
	1884 — 48 „ „ 31.
	1885 — 49 „ „ 20. Amendment of Act of 1884.
Tasmania	1874 — 38 Victoria, No. 6.
	1885 — 49 „ „ 21. Amending Act.
	1889 — 53 Victoria, No. 18. Amending Act.

This is a tolerably extensive list for so small a community, and, if we cannot rival the prolific legislation of the United States, we have at least sufficient to keep us fully employed in complying with the requirements of the various legislatures, to say nothing of the perpetual vigilance necessary to prevent these bodies from further tinkering. All the colonies have separate Acts dealing with the question of the property of married women, but I shall only refer to this matter in the cases where it is embraced in the provisions of the life Acts referred to above. Instead of dealing with these various Acts *seriatim*, I propose to select the subjects which have engaged the attention of the legislative bodies, and to briefly indicate the method of treatment followed by each colony.

Conditions Precedent to Transaction of Business.

In the colonies of New South Wales and Queensland, there is no restriction on the commencement of business; a brass plate and a little effrontery being all that are necessary to enable any enterprising

individual to establish a life assurance office. A foreign office in the first-named colony, being sued for an alleged debt, and pleading that it was not registered in the colony, and consequently not amenable to its laws, succeeded in the plea. All the other colonies require evidence of *bonâ fides* in the form of a more or less substantial deposit with the Government. The amounts of these deposits in the various colonies are :—

Victoria	£5,000, until the fund accumulated out of premiums reaches £15,000.
South Australia	Securities to the value of £5,000, and 25 per cent. per annum of the excess of receipts over disbursements in the colony, until the amount so deposited reaches £20,000.
West Australia	Securities to the value of £10,000, with similar provision to that in South Australia.
New Zealand	Securities to the value of £5,000, and certain proportions of the premiums received annually until the deposit amounts to £20,000.
Tasmania	Similar provision to that of Victoria.

One feature of these provisions is that (subject to certain conditions which need not be enlarged on), these deposits are held to be assets, which, in the case of liquidation, would be available only for the discharge of liabilities under policies on the registers of the respective colonies to which they apply. Such a provision is possibly *ultra vires;* it certainly is ineffectual, inasmuch as no provision exists for a proper relation between assets and liabilities.

Conditions to be observed in the Conduct of Business.

In all the colonies, except New South Wales and Queensland, every office carrying on business is required to appoint an officer who can be sued as the representative of the office, and who can be held liable for penalties incurred for non-compliance with the provisions of the various Acts. All these Acts prescribe certain annual and valuation returns which are to be rendered to the various Governments at certain specified periods. These returns are in the form of schedules based on those in the English Act of 1870, but the information required is much fuller and more comprehensive. The Colonial legislatures have followed the English as opposed to the American practice, and have left the offices free to follow their own opinions in the conduct of the business, while they require the utmost publicity with regard to the methods pursued. I venture to think that the schedules of the Colonial Acts are an improvement on those of the English Act of 1870. In none of the colonies, with the exception of New Zealand, has any attempt been made to fix a standard of solvency. In New Zealand, however, a standard has been fixed,

although this fact does not appear to be generally known. Nevertheless, section 35 of the Act, 37 Victoria, No. 18, provides for the winding-up of a company upon its been proved to the satisfaction of the Court that the actual funds of the Company are not of a net cash value equal to its liabilities, counting (as such) the net value of its policies according to the "combined experience" or "Actuaries rate of mortality, with interest at four per centum per annum." The phraseology shows the clause to be of American origin. It is necessary, however, that action be taken by policyholders, and, happily, none of these have as yet been found sufficiently interested to take proceedings against such offices as do not employ a standard of valuation equal to that mentioned above.

Married Women.

All the colonies have passed Married Women's Property Acts, which virtually place a married woman in the same position as a man in the matter of making contracts and holding life policies; in addition to which, New South Wales, Queensland, and New Zealand have made provision in their life Acts empowering married women to effect policies and hold the same in their own right.

There is nothing new in the various points referred to above; the subjects dealt with will be found treated with more or less modification in the legislation of other countries; in fact, our own legislation thus far has been largely borrowed from other countries. I now, however, propose to deal with several matters, the subject of legislation in these colonies, which I think distinctive of Australasian practice.

The Protection of Policies from the Claims of Creditors.

The first point to which I allude is that of the protection of policies in case of the insolvency of the lives assured. This provision, which is in operation in all the colonies, subject to various modifications explained below, applies only to the protection of the interest of the life assured during his lifetime, or of his personal representatives in case of his death; the protection does not extend to assignees of policies. The provision dates its origin from the year 1857, in which year the Australian Mutual Provident Society, then the only Australian life office in existence, obtained an Act of Incorporation from the New South Wales Legislature. In the year 1862, the New South Wales Legislature passed a general Act dealing with this question, and the rights of married women. As the proceedings of all the colonial legislatures in connection with this question may be traced to this enactment, I append the clause in the Act of Incorporation referred to:—

"XIV.—The property and interest of every member, or of his "personal representatives, in any policy or contract made or entered "into *bonâ fide* for the benefit of such member, or his personal "representatives, or in the moneys payable under or in respect of "such policy or contract (including every sum payable by way of

" bonus or profit), shall be exempt from liability to any law now or " hereafter in force, relating to bankruptcy or insolvency, or to be " seized or levied upon by the process of any Court whatever. " Provided that no policy or contract for a life assurance or endowment " shall be so protected, nor any contributions made towards the " same, until it shall have endured for at least two years, but, that " after an endurance of two years, such protection shall be afforded " to the extent of two hundred pounds of assurance or endowment " and to the contributions made towards the same, and after an " endurance of five years to the extent of five hundred pounds, " and after an endurance of seven years to the extent of one thousand " pounds, and after an endurance of ten years to the extent of two " thousand pounds ; and that no policy for providing an annuity, nor " the contributions made towards the same, shall be protected until " the payments made on behalf of such annuity shall have extended " over a period of six or more years, or unless it shall have been " purchased at a date more than six years prior to the commencement " of the annuity, and that such annuity shall not exceed the sum of " one hundred and four pounds per annum : Provided also that the " protection hereby afforded, shall, in the case of an annuity, accrue " only to the benefit of the member himself, and only to such part " thereof as shall be payable after he shall have attained the age of " 50 years ; and in the case of an endowment, for the benefit of the " nominee only ; and in the case of a life assurance, for the benefit " of the personal representatives only of the member, and in no " case for any assignee of the member."

The clause in the New South Wales Act of 1862 is identical in principle with the foregoing, though the wording is somewhat modified. It will be observed that the limit of protection was fixed at £2,000, and this has not been exceeded in any subsequent legislation. It has been surmised that the limit is due to the fact that at the date of the enactment, the Australian Mutual Provident Society did not accept a risk in excess of £2,000 on a single life ; of this, however, I can say nothing. Some doubts have been expressed whether the protection here indicated applies to each of several policies on the same life, or only to the total sum assured by any number of policies. The question seems to be still in doubt, although there is one legal decision on the point.

In the Victorian Act, the clause relating to this question reads as follows :—

" 369.—The property and interest of any person to the extent " of one thousand pounds in the whole in any policy or policies of " assurance on his own life, shall not be subject to be seized or " taken in execution under the process of any court, and in the " event of insolvency of such person, shall not vest in the assignee or " trustee of his estate, unless such insolvency occurs within two years " after the date of the policy, and on the death of such person, shall " not be assets for the payment of his debts ; but if he die within " two years after the date of the policy, a portion of the sum " assured equal to the amount of premiums actually paid, shall be " assets for the payment of his debts. In this section the term

"'insolvency' includes liquidation by arrangement and composition "with creditors under any Act now or hereafter to be in force."

This clause leaves no room for the doubt expressed above, in the case of the life assured dying in insolvent circumstances; but an extraordinary decision of the Full Court of Victoria, in the case of Davey *v.* Pein, 10 V. L. R. (E) 306, makes the protection (in some cases) practically unlimited, when insolvency occurs during the life of the life assured. That decision held that the words "the property and interest of any person to the extent of £1,000" meant not the sum assured on such person, but the surrender-value of the policy or policies held by him. As some offices do not pay cash surrender-values, the decision, if correct, conflicts with the obvious intention of the legislature.

The Queensland Act is similar in intent to the Victorian, except that in case of insolvency within three years, the premiums paid with 6 per-cent interest may be claimed by creditors. This Act, however, proceeds—"and provided also that the protection of this "section shall not extend to any moneys which shall actually be "received under or in respect of any policy by the insured in his "lifetime." In other words, the protection does not extend to the proceeds of a maturing endowment-assurance policy. It is believed, however, that the office is not concerned to see to the proper disposition of the moneys claimed under a maturing endowment assurance, the discharge of the member being sufficient. Should there be unsatisfied creditors, their remedy lies against the member.

In South Australia, the question has given rise to numerous perplexing situations. The Act of 1882 aimed at providing the protection on the lines and to the extent provided by the New South Wales Act, except that the limit was placed at £1,000 after seven years. In a case tried in 1885, however, it was ruled that the protection existed only during the life of the assured and ceased at his death. To remedy this defect the amending Act of 1887 was passed, dealing with this question alone, and consisting of 16 clauses and 2 schedules. It proved to be so unsatisfactory that it was repealed by the later Act of the same year, which now governs the question. Under this Act the protection is extended to a policy or policies assuring not more than £2,000 in the aggregate, provided it or they have existed for two years.

In the West Australian Act, the protection afforded is exactly similar to that of the New South Wales Act, but it leaves room for doubt whether the protection extends to each of several policies.

In the Tasmanian Act of 1874, the protection was extended (after a policy had endured for two years), to "any policy or policies . . . . . to the extent of £1,000 in the whole in any company." This left a doubt as to whether the protection extended to a policy or policies for £1,000 in each of half-a-dozen companies, and in the amending Act of 1885, the question was set at rest and the protection limited to £1,000 in the whole in the sum assured, provided the assurance had existed for two years, failing which the premiums paid are made assets in the estate.

New Zealand has been the theatre of much legislation on the subject. The Act of 1873 provided protection similar to that afforded

by the New South Wales Act. The Act of 1884 repealed the sections of the 1873 Act relating to this question, and provided protection to the extent of £2,000 to policies "dependent on the contingencies of the life of the policyholder himself", (and thus apparently excluding endowment-assurances maturing), provided the premiums were payable for life, or for a term of not less than seven years. The amending Act of 1885 extended the protection to other policies after they have been in existence for seven years.

This brief resumé of the proceedings of the Australian legislatures, in connection with this question, will indicate not only the difficulties which appear to beset its settlement, but the irritation which must be caused to offices which carry on business in all the colonies, and which, while anxious to conform to the requirements of the legislatures, are desirous of conserving the interests of their clients. This is not the place to discuss the merits of the principle; it will be sufficient to say that the public of these colonies are firmly persuaded of its wisdom.

Assignments.

The next question to which I shall allude is that of the assignment of policies. It is customary in the colonies to speak of assignments of two kinds, namely, absolute and conditional; the latter term is sometimes applied to a mortgage. I shall, for clearness, speak of the two as assignments and mortgages.

In New South Wales and Queensland, no special provision is made for the assignment or mortgage of a policy, and the ordinary legal procedure has to be followed.

In Victoria every assignment shall, and in South Australia, West Australia, and Tasmania, may, be made in the form of a schedule given in the various Acts. This schedule, when duly filled in with the particulars, and signed by the assignor, assignee, and principal officer of the company, effects a legal assignment of the policy. The Acts controlling the business in these colonies, however, provide that a mortgage must be by way of a separate instrument. As the latter entails legal expenses and the former costs nothing, it is the almost invariable practice of policyholders, intending to give only mortgages of their policies, to execute assignments; a practice which, it need scarcely be pointed out, often leads to grave injustice.

The New Zealand Act of 1884 contains 31 clauses and 12 schedules dealing with the questions of assignment, sale, and mortgage. It not only gives forms for use in assignments, sales, and mortgages, but provides what "covenants, powers, conditions, and agreements" are implied, both in mortgages to the company issuing the policy, and to outside mortgagees. The Act is but one indication of the paternal legislation of New Zealand.

Lost Policies.

The question of lost policies has always been a troublesome one. In sparsely-peopled countries, like these colonies, where large numbers are of migratory habits and unsettled occupations, policies are frequently lost, and the position of the holders thereof requires to

be considered. The general practice of the offices has been to issue, when requested, a certified copy of the policy, for the satisfaction of the member. Such a document, however, can possess no value, and in case of a claim arising under such a policy it has been usual to require a bond of indemnity. In the colonies of New South Wales and Victoria, this difficulty has been met by legislative enactments. Under the provisions of these Acts, when a company is satisfied that a policy has been lost or destroyed, it may give one month's notice by advertisement in two newspapers of its intention to issue a special policy in lieu of that lost or destroyed. On the expiration of such notice, it may issue a special policy, which at once becomes invested with all the rights of the original policy, the latter in turn becoming valueless.

Transfer of Policies from Colony to Colony.

Almost all the Australasian offices have branch offices with Local Boards of Directors, in the several colonies. Such Boards of Directors, although they hold their appointments from the Principal Boards, which are usually elected by the policyholders, are invested with large powers in regard to the acceptance of lives and the investment of moneys. A policyholder who has been resident in one colony, and has effected an assurance there, frequently changes his domicile, and takes up his residence in another colony, and his usual practice is to have his policy transferred from the books of the former colony to those of the latter. The payment of his premiums, and, indeed, all his transactions with the office then become the concern of the management in the colony which is for the time being his place of domicile. Such transfers sometimes occur half-a-dozen times in the life of a policy. In the case of death, then the question arises as to the location of the *bona notabilia*, and the place where probate should be taken out. It appears to be the legal view that a contract made in one colony remains (in the absence of legislation to the contrary), for all time a contract of and subject to the laws of that colony. In that case, probate of the will of a person who has taken out a policy, say in New South Wales, but who has resided for 20 years, say in South Australia, and has died there, would require to be taken out in New South Wales. The question has never yet been before the law courts, and no practical inconvenience has been so far experienced in connection with the matter, but it is not difficult to imagine circumstances which might give rise to grave complications. To remedy this, the Acts of Victoria and West Australia provide that any policies transferred from these colonies elsewhere become contracts of the colony to which they are transferred, and similarly policies transferred from elsewhere to Victoria or West Australia, become contracts of the colonies to which they are transferred.

Registration of Policies.

A provision peculiar to the New Zealand Act of 1873 is that relating to the registration of policies. Under this provision any policyholder in any life office may, on payment of a fee of 5*s*., register his policy with the Public Trustee. No company carrying on

business in New Zealand will be permitted to withdraw any portion of the deposit made in accordance with the requirements of the Act, unless a sufficient remainder is left to meet the liabilities under registered policies. It is unnecessary to point out the defects of this provision; it will be sufficient to say that it is practically a dead letter.

Declaration of Surrender-Values.

One or two fugitive attempts have been made to embody in legislative enactments the practice of the Australasian Offices in respect of the non-forfeiture regulations. The South Australian Act of 1882 requires every company to declare the surrender-value at which it will accept its policies, and provides that no policy shall be allowed to lapse so long as such surrender-value is in excess of the overdue premiums and interest. As this leaves the Company perfect liberty to declare the surrender-value of a policy at any figure it pleases, and as no such declaration has yet been made, this question may be summarily dismissed.

Admission of Age.

The Queensland Act provides that when a policy has been in force for three years, the Company issuing the same shall be compelled to admit the age of the life assured, although no proof may have been submitted. Attempts, which have fortunately so far proved abortive, have been made to embody a similar provision in the laws of New South Wales and Victoria.

Payment of Claims without Probate.

In all the colonies it has been recognized that as the only asset frequently left by persons dying is a small life policy, it is desirable that claimants should be spared the expenses of probate or letters of administration. Consequently, authority has been given to the Board of Directors of the various companies to pay small claims to such persons as to them appear entitled, without the necessity of any application to the Courts. The extent to which the discretion is allowed in the various colonies ranges from £100 to £250. A recent amendment of the Probate Act of New South Wales has so cheapened the process that the provision is unnecessary in that Colony.

There remain but two other points to which attention may be directed:—

(*a*) The Acts of several Colonies, as I have already stated. provide that the deposits made in obedience to the requirements of such Acts, or any other sums deposited as secured assets, shall, in the event of winding up, be assets for the liquidation of local liabilities.

(*b*) In New Zealand, the companies are required to insert in their policies a clause binding them to submit to the decision of the Supreme Court of the Colony, and thus to abandon any right of appeal to the Privy Council.

As both these provisions are possibly *ultra vires,* I refrain from discussing them.

I have now, I think, referred to all the points of interest in the various enactments in these colonies. Notwithstanding their variety, we are being constantly threatened with further legislation. We entertain the hope, however, that the problem of Australian Federation is within measurable distance of accomplishment, and to it we look for a relief from many of the troubles which now vex our souls and try our tempers.

State Life Insurance in New Zealand. *By* J. H. Richardson, F.F.A., A.I.A., *Government Insurance Commissioner.*

Introductory.

The New Zealand Government Life Insurance Department was established in the year 1869, at the instance of Sir Julius Vogel, who tabled a motion in the House of Representatives recommending the Government to introduce a measure which would create a special Department of the State for the purpose of insuring, and granting annuities on, the lives of such people as desired to avail themselves of the guarantee of the colony, in addition to the ordinary security provided by the funds of a life office. This motion was supported by the Hon. Sir John Hall, at that time Postmaster-General, and was duly carried, I believe, unanimously. In the same year there was a change of Government, and Sir Julius—who had in the meantime become a Minister of the Crown—introduced a Bill which gave practical effect to the motion, the adoption of which he had already secured.

Synopsis of the Laws of the Colony Regulating the Department.

Since that time there have been several amendments of the law as might naturally be expected from the evolution of the business. It will be unnecessary for me to specify the various amendments, and I shall therefore only give a brief synopsis of the constitution of the Department, according to the Acts regulating the Department's affairs at the present time.

The management of the Department is vested in an officer called "The Government Insurance Commissioner", who is appointed by the Governor on the recommendation of the Ministry of the day, and is a member of the ordinary civil service of the colony, holding office in the same manner as other civil servants. In order to prevent any deadlock, the Governor may appoint a deputy to act in the case of the absence, illness, or other temporary incapacity of the Commissioner. The Government Insurance Commissioner has power to enter into any contracts for annuities, and for insurance of lives as well as any contracts whatever dependent on the contingencies of human life, under such regulations and in accordance with such tables as shall, from time to time, be approved by the Governor. The maximum of insurance on one life has been raised from time to time as the funds of the Department have progressed. At present the Department does not insure more than *£4,000* on any one life. The Commissioner may increase premiums in proportion to the badness or ineligibility of a life, or he may decline the risk altogether. In all matters of litigation on account of the Department, the Commissioner may sue and be sued.

The Acts regulating the affairs of the Department provide, however, for arbitration in certain cases. If there are any disputes between the Commissioner and other parties, as regards annuities or death claims, the matter may be referred to the arbitration of two disinterested persons, one to be chosen and appointed by the Commissioner, and the other by the party with whom the dispute has arisen. In the event of there being any disagreement between the arbitrators, the matter in dispute has to be referred to an umpire to be appointed by the arbitrators before they enter upon the consideration of the matter referred to them. The award of the arbitrators or the umpire, as the case may be, is final and without appeal, except on a point of law. The arbitrators and umpire respectively have all the powers possessed by a court of law to summon witnesses and examine evidence, &c. Before matters are referred to arbitration, the Commissioner may, however, require a deposit of money as security for the costs of the arbitration.

All moneys payable to the Department are required by the Act to be paid into a separate account at the bank, where, for the time being, the public account of the colony is kept, to the credit of an account called the Government Insurance Account, and if at any time the moneys standing to the credit of that account should prove insufficient to meet the charges thereon, the deficiency has to be made good out of the consolidated fund of the colony.

Salaries and expenses of management are paid out of the Government Insurance Account from moneys from time to time appropriated by the New Zealand Parliament, but all payments under policy and annuity contracts for insurance annuities and endowments, or for loans on policies, or for investments, are made out of the Government Insurance Account without such appropriation by Parliament.

The Department is subject to the ordinary State audit of the colony, and the Government Insurance Account at the bank is operated on by the Government Insurance Commissioner by cheque, which has to be countersigned by the Controller and Auditor-General of the colony.

The Commissioner has to prepare for presentation to Parliament, a revenue account and balance-sheet for the preceding annual period, and such statements of accounts are accompanied by a report by the Commissioner on the year's transactions. An actuarial investigation is made into the affairs of the Department every three years, and all profits (subject to suitable reserves being made) are then divided amongst the participating policyholders.

The investments of the Department do not materially differ from those of an ordinary life insurance institution. They are in the main confined to New Zealand Government Securities, loans to local bodies (municipal corporations and the like), secured by special rate, loans to policyholders on the security of their policies, limited to 90 per-cent of the surrender value, and loans on mortgage of real estate, the last-named not to exceed three-fifths of the valuation. Not more than *£10,000* can be lent on one real estate security, nor more than that sum to any one person or company. No loan can be granted to a local body unless with the joint concurrence of the Board hereinafter mentioned and the Governor.

For the purpose of controlling and managing the mortgage investments on land of the Department, a Board is constituted, consisting of the Colonial Treasurer of the Colony, the Solicitor-General, the Surveyor-General, the Commissioner of Taxes, the Public Trustee, and the Government Insurance Commissioner. The Board must be unanimous before any loan on mortgage can be granted, and three members of the board form a quorum.

The Staff of the Department.

As already explained, the statutory duties under the Acts, regulating the affairs of the Department and the general management of the Department, are vested in the Government Insurance Commissioner. The Commissioner is assisted at the head office by the assistant commissioner (who also holds the position of deputy commissioner, the duties of which are explained in my remarks regarding the constitution of the Department), the actuary, the secretary, and the supervisor of new business. For all practical purposes the staff may be regarded as the same as that of an ordinary life insurance institution.

For purposes of control, the colony is divided into four districts, each of which is supervised by an officer called a district manager. Subject to the control of the Commissioner, the district managers are responsible for the management of their respective districts. It is their duty to recommend suitable gentlemen as canvassing agents, and to make suitable arrangements which will ensure their districts being thoroughly canvassed. The district managers are paid partly by results. They receive a fixed salary and a commission on the net increase in the sum assured by the policies in their respective districts. Such net increase is arrived at by deducting the sum assured under the policies which have become void by death, lapse, surrender, &c., during the year, from the sum assured under the new policies issued during the same period. Where the Department has not a district manager or resident officer, it is customary to employ the local postmaster. All such postmasters are paid a commission for any work they may perform for the Department. Travelling agents are paid strictly by results. Their remuneration depends entirely on the amount of business they introduce. For all practical purposes they may be regarded as being on the same footing as the canvassing agents of an ordinary life insurance institution.

The Department's Methods of Business.

The Department is conducted precisely on the same principles as those adopted in ordinary life insurance offices in which the profits are divided solely amongst the assured. It is in all respects a mutual self-supporting office. All expenses and taxes (to which the Department is subject in common with other life insurance offices transacting business in the colony) are borne by the policyholders, and the business is conducted on ordinary commercial principles. All classes of policies ordinarily issued by life offices are granted, the colony being vigorously canvassed by duly accredited travelling agents. All profits are divided amongst the assured, who, in addition, have the

guarantee of the State that their contracts will be duly met at death or maturity.

Conditions of Policies.

The following are the more important conditions affecting policies:

30 days of grace are allowed for the payment of all premiums. Policies which have not acquired a surrender-value, when the premiums become overdue, may be revived at any period not exceeding 12 calendar months after the expiry of the 30 days of grace subject to proof of health to the Commissioner's satisfaction, and on payment of the arrears and a suitable fine. Ordinary policies acquire a surrender-value after they have been in existence two years, and in the event of the premiums falling in arrear are kept alive out of the surrender-value so long as such surrender-value is sufficient, after the deduction of any loan that may have been advanced or any charges that may have accrued, to cover one quarter's premium. Any such policy may be revived within 12 months after the exhaustion of the surrender-value, subject to payment of arrears and a fine and to proof of health to the commissioner's satisfaction.

The Department's condition as regards suicide differs considerably from that usually adopted. Until recently the Department's policies became void if the person whose life is insured died by suicide, whether sane or insane, within twelve months from the date of the policy. This condition was thought to be somewhat illiberal, but the Department was not prepared to waive the suicide clause altogether, and it was considered that the following condition would fairly meet the case:

Policies shall become void if the person whose life is insured shall die by suicide, whether sane or insane, within six months from the date of the policy; provided nevertheless that it shall be lawful for the Commissioner in his absolute discretion to pay the sum assured if he is satisfied, after careful inquiry, that the person whose life is insured had not at the date of the policy any suicidal intention.

I find that the new condition works well in practice. It is sufficient to act as a deterrent to prevent people effecting policies with a view to committing suicide, while, on the other hand, it does not prevent the Department paying claims where there was no suicidal intention at the time the policy was obtained. Care is, of course, taken to peruse the inquest papers, and evidence is obtained from the canvassing agent in order to ascertain the circumstances under which the proposal was obtained. Cases in which the policy was effected voluntarily, without solicitation, would, of course, be looked upon with grave suspicion.

Surrender-Values.

Whole-life insurance policies and endowment insurance policies may be surrendered after they have been in force for two years. Whole-life insurance policies or endowment insurance policies fully paid-up may be surrendered at any time after date of issue. Short term policies and other policies than those mentioned above are specially dealt with. The method or methods upon which surrender-values are calculated are determined by the Commissioner.

In lieu of the surrender-value paid-up policies are granted, provided such surrender-value, after deduction of charges thereon, is equivalent to a paid-up policy of at least £20. The method of calculating surrender-values is that usually adopted in life insurance offices.

The following table shows the progress of the department since its establishment in 1869:

Year	New Business		Business in Force at End of Each Period		Income (from)		Paid to Policyholders	Added to Funds	Accumulated Funds
	No. of Policies	Sum Assured	No. of Policies	Sum Assured	Interest	Premiums			
	...	£	...	£	£	£	£	£	£
1870–1871	463	206,361	454	200,611	...	7,509	...	5,113	5,113
1871–1872	1,357	461,310	1,689	625,421	543	17,545	1,526	10,041	15,154
1872–1873	1,157	428,615	2,634	995,986	1,343	30,132	3,213	21,761	36,915
1873–1874	1,499	510,010	3,953	1,453,496	2,332	43,379	7,033	30,321	67,236
1874–1875	1,374	483,223	4,989	1,836,859	4,207	64,275	14,221	42,732	109,968
1875–1876	1,249	481,170	6,153	2,282,129	6,669	72,253	23,755	43,749	153,717
1876–1877	1,411	564,228	7,149	2,716,907	9,133	82,852	14,438	65,677	219,394
1877–1878	1,994	681,109	8,711	3,251,220	12,601	98,582	21,645	73,129	292,523
1878–1879	2,073	687,574	10,223	3,726,330	16,737	115,858	35,699	79,367	371,890
1879–1880	2,266	722,554	11,656	4,171,504	21,098	125,076	39,088	87,446	459,336
1880–1881	1,790	550,351	12,411	4,352,496	26,506	130,048	39,394	97,895	557,231
1881–1882	2,523	702,909	13,810	4,695,388	31,310	139,996	53,593	96,659	653,890
½-year 1882	2,547	631,279	15,892	5,176,217	17,711	77,076	27,448	50,999	704,889
1883	5,113	1,039,916	19,917	5,898,951	41,173	174,372	42,923	141,271	846,160
1884	3,309	800,016	21,003	6,135,636	48,472	179,959	72,783	126,616	972,776
1885	4,379	859,770	23,218	6,466,276	52,150	188,586	72,626	129,259	1,102,035
1886	3,560	717,464	24,715	6,670,741	58,205	197,324	81,660	129,899	1,231,934
1887	3,124	766,952	25,439	6,831,934	66,380	201,904	125,019	96,559	1,328,493
1888	2,957	785,093	26,168	7,076,252	73,421	208,740	110,411	123,986	1,452,479
1889	3,187	781,255	27,218	7,326,129	81,386	217,308	112,102	129,969	1,582,448
1890	2,761	684,242	28,102	7,544,030	89,796	223,610	103,744	132,745	1,715,193
1891	2,934	699,901	29,226	7,782,734	96,379	234,496	144,574	132,604	1,847,797
1892	2,634	642,104	30,316	8,036,220	100,639	241,965	157,408	132,501	1,980,298
1893	3,263	740,428	31,709	8,302,257	108,098	253,574	141,321	148,292	2,128,590
1894	3,301	729,013	32,907	8,506,289	115,270	254,204	178,107	135,649	2,264,239
1895	2,874	608,048	33,968	8,651,967	119,973	266,032	171,544	164,006	2,428,245
1896	2,864	605,986	34,772	8,754,804	124,255	270,720	166,369	163,097	2,591,342
	...	...	...	...	1,325,787	4,117,375	1,961,644	...	...

Policies in force as at 31 December 1896.

The following is a summary of the different classes of business in force as at the above date:

Class of Business	Number of Policies	Sums Assured	Bonuses	Annuities
		£	£	£
ASSURANCES.				
WITH PARTICIPATION IN PROFITS.				
Whole Life Assurances, Uniform Premiums	17,253	4,915,750	398,988	...
Whole Life Assurances, Limited and Single Premiums	909	392,112	76,963	...
Endowment Assurances, payable at Death or Maturity	14,883	3,144,268	184,555	...
Double Endowment Assurances	960	243,600	...	...
Joint Life Assurances, Uniform Premiums	15	8,375	314	...
Survivorship Assurances	1	500	66	...
Annuity Assurances, Temporary Assurance with Deferred Annuity	76	9,600	...	3,508
Annuity Assurances, Whole Life Assurance with Deferred Annuity	55	7,450	...	2,641
Total Assurances, With Profits	34,152	8,721,655	660,886	6,149
WITHOUT PARTICIPATION IN PROFITS.				
Whole Life (transferred from Temperance to Non-Profit	5	850	4	...
Endowment, Without Return of Premiums	1	100	...	...
„ With „ „	228	27,376	...	...
Temporary Assurances	2	750	...	...
Investments	126	3,738	...	...
Industrial	17	334	...	...
Total Assurances, Without Profits	379	33,148	4	...
TOTAL ASSURANCES	34,531	8,754,803	660,890	6,149
ANNUITIES.				
Immediate	224	...	...	9,707
Joint and Survivorship	8	...	...	711
Reversionary	1	...	...	300
Deferred, Without Return of Premiums	7	...	...	190
„ With „ „	1	...	...	50
Total Annuities	241	...	...	10,958
TOTAL OF THE RESULTS	34,772	8,754,803	660,890	17,107

ASSETS.

The following is a summary of the Department's assets as at the end of 1896, the last date to which the accounts have been published.

The assets are held in trust for the policyholders insured in the Department, and are specially "ear-marked" to them by Statute.

	£	s.	d.
Loans on Policies	464,829	0	4
Government Securities	872,016	2	7
Municipal Corporation Debentures	106,721	3	4
County Securities	1,000	0	0
Otago University Debentures	15,000	0	0
Harbour Board Debentures	43,411	10	8
River Board Debentures	435	0	0
Town Board Debentures	500	0	0
Landed and House Property	116,169	16	9
Office Furniture (Head Office and Agencies)	3,256	2	6
Mortgages on Property	812,585	11	9
Properties acquired by Foreclosure	29,906	11	0
Outstanding Premiums	33,856	4	1
Interest Outstanding and Accrued	33,276	10	4
Agents' Balances	3,746	19	11
Sundry Accounts owing	1,456	16	9
Cash in hand and on Current Account	109,990	9	4
	2,648,157	19	4

Valuations.

The following table contains particulars of the actuarial valuations that have been made from time to time:

Date	Basis of Valuation		Surplus.	Cash Divided.	Reversionary Bonus Declared.
	Assurance	Annuities			
			£	£	£
30 June 1875	H^M 4½ per-cent	Carlisle 4½ per-cent	12,191	Nil	Nil
30 „ 1880	„	„ 4 „	73,671	56,000	124,552
31 Dec. 1885	„	British Government Experience 1884 4½ per cent	242,557	150,000	319,391
„ 1890	H^M 4 per-cent	„ 4 „	232,652	200,000	396,439
„ 1893	„	„ „ „	190,000	140,000	277,268
„ 1896	„ *	„ „ „	225,000	144,000	257,911
				690,000	1,375,561

* The reserve of £81,000 set aside on this occasion made the standard equivalent to H^M 3⅞ per cent.

Landed and House Property.

The Department's landed and house property at the larger centres throughout the colony is valued at £116,000. Such parts of the buildings as are not used by the department are let to tenants. The Department has large offices at Wellington (the head office), Auckland, Christchurch, and Dunedin.

Temperance Section.

In July 1882 the Department opened a special section confined to policyholders who totally abstain from all intoxicating liquors and desire to be insured in the section.

The original intention was to constitute a distinct branch of the Department, keeping the receipts, expenditure, funds, valuations, and profits entirely separate. For the first few years the premiums, claims, surrenders, commission, and medical fees were kept separate, but the interest and general expenses were not so kept.

In 1885, valuations of the two sections, general and temperance, were made separately by the consulting actuaries of the Department in London, who apportioned the total funds between the sections by assigning to each section the expenses which admitted of being specifically appropriated, such as commission and medical fees; by dividing the remaining expenses between the two sections in proportion to the premium income of each; and by dividing the interest between the two sections in proportion to the average fund of each for that particular year.

The result of these valuations was that, while there was a substantial surplus in the general section, there was a deficiency of £2,759 in the temperance section. This deficiency was mainly owing to the short duration of the section, only 2½ years. As a matter of course, no bonuses were allotted to temperance policyholders on this occasion.

Early in the history of the temperance section there arose a demand on the part of the total abstainers in the general section to be transferred to the former section. This demand was complied with, and, until the end of the year 1888, transfers from general to temperance were allowed, being limited to those policyholders whose policies were their own absolute property, and were dated before 1 July 1882, and also provided that each policyholder had been a total abstainer since taking out his policy. The total number of policies so transferred was 58, assuring £17,910.

Before the end of 1888, however, when these transfers ceased, dissatisfaction had arisen in the temperance section in consequence of the results of the 1885 valuation. The net surplus in the general section was distributed in April 1887, and it was soon felt that the temperance policyholders were keenly dissatisfied at receiving no bonuses at the same time. This dissatisfaction being very pronounced, and exhibiting a tendency to seriously interfere with the business of the Department, steps were taken to secure fresh legislation enabling the two sections to be amalgamated, excepting so far as profit from mortality was concerned. The amalgamation of the two sections was approved by the New Zealand Parliament, and was given effect to by "The Government Life Insurance Acts Amendment Act, 1890", which sets forth that the amount of profit from favourable mortality in the general and temperance sections is to be ascertained separately, and divided exclusively amongst the policyholders of the section in which it has arisen, and that the remaining portion of the profits is to be divided, irrespective of the section to which policyholders belong, and at the three subsequent valuations of 1890, 1893, and 1896, a method of dissecting profit from mortality, approved by our consulting actuaries, was adhered to.

The question of the treatment of backsliders received careful and anxious consideration in the early years of the temperance section, but it was not necessary to ask for declarations of total abstinence until the first division of profits among temperance policyholders in 1890. The settlement of this difficult matter was finally effected by the Act of 1890, above referred to, which sets forth that all temperance policyholders who fail to adhere to the principle of total abstinence, except for sacramental purposes, shall be removed from the temperance section unless any case shall be proved, to the satisfaction of the Commissioner, to have been one of extreme urgency. Those so removed are divided into two classes:

(1) Those whose prospects of longevity have not in the opinion of the Commissioner been impaired through use of alcoholic or fermented liquors, and whose habits would permit of their being insured in the general section if they were proposing for new insurance, and

(2) Those whose prospects of longevity have, in the opinion of the Commissioner, been impaired through the use of alcoholic or fermented liquors, or whose habits would not permit of their being insured in the general section if they were proposing for new insurance.

Class (1) to be transferred to the general section, and Class (2) to a "non-profit" section.

In consequence of the Act of 1890 (referred to in last paragraph), a special condition was endorsed on all new temperance policies as follows: In the event of the assured failing to abstain from all intoxicating liquors (except for sacramental purposes) at any time during the currency of this policy, he shall thereupon be removed from the temperance section, subject to the provisions of "The Government Life Insurance Acts Amendment Act 1890", and before each distribution of profits a declaration of continued abstinence is required from every temperance policyholder. Transfers to the general section in accordance with the Act of 1890 are effected by endorsement, and a new number in the general section is given to the transferred policy. In transfers to the non-profit section the number remains unaltered. The policies so transferred to the end of March 1897 are as follows:

	General			Non-Profit		
	No.	Amount		No.	Amount	
		£			£	
1891	216	51,025		10	2,150	
1893	111	26,239		6	775	
1895	1	300		−(1)	−(300)	Transferred to General Section
1896	151	32,025		...	...	
1897	58	13,172		...	...	
	537	122,761		15	2,625	

Of the non-profit policies, only four for £650 remain in force, the others having become void thus:

		£
Maturity . . .	1	200
Surrender . . .	2	600
Lapse	8	1,175
In force . . .	4	650
	15	2,625

At the amalgamation of the two sections in 1890 the accounts which had been kept separate for the two sections were amalgamated.

There have been four divisions of profits since the inauguration of the temperance section—in 1885, 1890, 1893, and 1896. On the first occasion, temperance policyholders received no bonus; in 1890, general and temperance bonuses were equal; in 1893, the temperance bonuses were slightly higher; and at the last valuation in 1896 the positions were reversed, and the general bonuses proved to be on a slightly higher scale than the temperance bonuses. It must, however, be borne in mind that the numbers in the temperance section are still too small to allow any definite conclusion to be drawn from these results as to the future bonus prospects of the two sections.

The following is a summary of the yearly progress of the Temperance section since its inception:

Year	Policies Issued		Policies Void		Policies transferred to General and Non-Profit Sections.		
	No.	Sum Assured	No.	Sum Assured	No.	Sum Assured	
		£		£		£	
1882	472	111,225	1	500	...	...	...
1883	998	204,424	10	1,950	...	...	...
1884	842	197,475	215	43,945	...	...	...
1885	1,112	225,154	304	64,802	...	...	...
1886	1,129	199,019	337	73,773	...	...	...
1887	518	112,995	511	115,778	...	...	...
1888	383	91,734	438	90,787	...	...	...
1889	430	95,146	301	63,941	...	...	...
1890	400	89,372	237	49,984	...	...	...
1891	432	90,733	231	48,963	226	53,175	...
1892	504	109,359	176	37,018	...	...	...
1893	657	137,800	226	51,340	117	27,014	...
1894	602	125,035	262	48,681	...	...	...
1895	484	90,175	229	52,836	...	...	...
1896	482	88,150	279	56,627	151	32,025	...
Total	9,445	1,967,796	3,757	800,925	494	112,214	...

	No.	Sum Assured
		£
Total Policies issued	9,445	1,967,796
Total void and transferred	4,251	913,139
In force	5,194	£1,054,657

The balance in force at the end of 1896 was therefore 5,194 policies assuring £1,054,657.

The Tontine Savings Fund System.

The first Tontine Savings Fund was introduced through regulations approved by the Governor, dated September 1887.

This first Fund is now known as "Tontine Savings Fund, No. 1", and was open for new policyholders to join until 31 December 1890, and for old policyholders (who were allowed to transfer their policies to the Tontine Class by endorsement) until the same date. At the end of 1890 the Fund No. 1 was closed to new entrants, and this Fund will be wound up at the end of 1900. In January 1891, a fresh Fund, Tontine Fund No. 2, was opened by regulations in the same manner, and this Fund will be closed to new entrants on 31 December 1900, and wound up on 31 December 1910.

Each Fund is composed of whole-life and endowment-assurance policies, but it is stipulated that no endowment assurance can be placed in a Tontine fund, unless it matures later than the date upon which the Fund will be wound up and distributed among those policyholders entitled to share.

The only difference between Tontine policies and ordinary with-profit policies is, that the bonuses allotted to Tontine policies do not vest and are not negotiable until the winding-up of the Tontine Fund. Tontine policyholders have all the privileges and benefits of ordinary policyholders, except the right of dealing with their bonuses during the Tontine period.

The Tontine Funds are formed of the proceeds of the bonuses on Tontine policies which become void during the Tontine period, together with their accumulations. Reversionary bonuses are allotted to Tontine policies in precisely the same manner as to ordinary policies.

Whenever a Tontine policy becomes void by death during the Tontine period, the full reversionary bonus (including prospective or interim bonus), is credited to the Tontine Fund; when a Tontine policy is surrendered, or the surrender-value becomes exhausted previous to the lapsing of the policy, the full surrender-value of all allotted bonuses (including prospective bonus), is credited to the Tontine Fund.

At the end of every year, the bonuses so credited to the Tontine Funds are accumulated from the date of policy becoming void to the end of the year at the average rate of interest earned on the general accumulated funds of the Department for the year, and, at the end of every year, the Tontine Funds as at the end of the previous year, are accumulated at interest in a similar manner.

Tontine policyholders are only allowed to borrow on the face value of their policies, and are not permitted to surrender their bonuses for cash, until the Tontine Fund to which they belong is wound up.

On the winding-up of Tontine No. 1 in 1900, and Tontine No. 2 in 1910, the respective Funds will be divided between the surviving Tontine policyholders whose policies are in full force on 31 December 1900, and 31 December 1910 respectively.

The shares of profit so determined (together with the bonuses

allotted to the Tontine policies during the Tontine period), then become the negotiable property of the respective Tontine policyholders, who will be allowed to deal with them practically in the same manner as ordinary policyholders may deal with their bonuses; that is to say,

(1) The total reversionary value of the bonuses may be added to the policy, which then becomes an ordinary policy at the original rate of premium;
(2) The whole of the policy (including bonuses) may be surrendered for the then equivalent cash value, paid-up assurance, or immediate annuity;
(3) The bonuses may be surrendered for the equivalent cash value or immediate annuity, and the original policy continued in force.

In Tontine No. 1, policyholders surrendering their bonuses for cash, and continuing their original policies in force, are allowed *the option of placing the policies so kept in force in a fresh Tontine;* in Tontine No. 2 no such option was allowed, as it was not known certainly that a new Tontine would be opened upon the closing of Tontine No. 2 to new entrants on 31 December 1900.

The position of the two Funds on the 31 December 1896, was as follows:

	No. of Policies in Force	Sum Assured in Force	Tontine Fund
		£	£ s. d.
Tontine No. 1 .	3,871	1,073,286	9,156 6 3
Tontine No. 2 .	3,186	788,400	1,361 10 2
Total . .	7,057	1,861,686	10,517 16 5

Civil Service Insurance.

"The Civil Service Insurance Act, 1893," came into force on 1 January 1894, and requires each officer (with certain exceptions), appointed to the Civil Service after that date, to effect a policy in the Government Insurance Department providing for the payment of a sum at death, should he die before 60 years of age, and an annuity until death should he survive that age; that is, a temporary assurance ceasing at age 60, and a deferred annuity commencing at that age. The officer, by paying an additional premium, may, if he so desire, have the insurance changed to a whole-life one. Under "The Civil Service Reform Act, 1886", 5 per-cent was deducted from the salaries of officers appointed after the passing of that Act, and accumulated at interest for their benefit, on retiring from the Service, or for the benefit of their representatives in the event of death. By "The Civil Service Insurance Act of 1893", civil servants appointed under "The Civil Service Reform Act, 1886", have the option of coming under the provisions of the former Act, and applying their existing accumulations to increasing the annuity payable under the scheme.

Officers who have attained an age which would render it inexpedient, or impossible, for them to effect policies providing for the combined benefits, may elect either to have a 5 per-cent deduction made, as provided under the Act of 1886, or purchase an ordinary assurance policy.

The policies under the Civil Service Insurance Scheme cannot be assigned or mortgaged, as long as the assured remains in the service.

Officers on retiring, or being dismissed, are entitled to continue their policies.

The annual deduction is £5 from every salary under £150; £7. 10*s.* for a salary of £150; and increasing £2. 10*s.* for each additional £50 of salary up to £800.

Regulations have been issued under the Act setting forth the benefits, and providing that the combined benefits shall only apply to persons appointed whose ages do not exceed 40 years. Persons appointed over 40 years' old and under 50 can select an annuity commencing at 60, or, provided they are able to pass the necessary medical examination, an endowment assurance payable at death, or 60. If the officer is over 50 years of age, he can insure under any of the Department's tables, on passing the necessary examination.

Whenever the deductions increase, such increase, and the corresponding increase in the benefits, are endorsed on the policy. The deductions made provide an insurance equal to a year's salary, as well as a pension beginning at age 60.

The number of policies under this scheme in force at 31 December 1896 was 168, insuring £26,850, and entitling the survivors at age 60 to annuities amounting to £6,186 per annum.

Postage Stamps.

The Department pays its own postage, just as any ordinary life insurance institution. By special arrangement, however, with the Postal and Stamp Departments of the colony, the Government Insurance Department possesses a special stamp of its own, the dies for which are retained by the Stamp Department, the stamps being supplied to the Insurance Department in exchange for cash as required. I believe that no other institution in the world has a separate postage stamp of its own, and as the arrangement in the case of this Department is unique, I append samples of the stamps in use.*

"Life Assurance Policies Act 1884", and "Life Assurance Policies Act 1884 Amendment Act 1885."

As all policies issued by the Department are affected by these Acts, it may not prove uninteresting to give a brief summary of their principal provisions, so far as they relate to the policies issued by the department.

Assignments and Mortgages of Policies.

The Department is not bound to receive, nor is it liable in any way to be affected by express, implied, or constructive notice, however given, of

* We regret that we are unable to reproduce these samples.—*Editor.*

any trust (affecting any policy) created after the passing of the Act. The Act provides forms for assignment and mortgage of policies both to outsiders and to the companies (including the Department) issuing the policies. In the former case the assignment is affected by endorsement in schedule form, as under:

*Form of Ordinary Transfer.**

Date of Transfer	Signature of Transferor	Witness Address Occupation	Transferee			Signature of Transferee	Witness Address Occupation	Date of Registration of Transfer	Signature of Commissioner
			Name in full	Address	Occupation				

* By this form of transfer, an absolute assignment of the policy is effected.

The policy thus endorsed is left at the Department's head office, whereupon the Commissioner, if in his opinion the transaction is in due form, signs and registers the transfer, and the policy becomes vested in the assignee, who thereupon becomes the holder of the policy and may thereafter sue, as well at law as in equity, in his own name on the policy assigned. The receipt of such assignee is a valid discharge, both at law and in equity, for all moneys payable thereunder. If any such assignment is upon any trust, such trust has to be effected by way of declaration of trust by some separate instrument, and no notice of any such trust is inserted in the assignment or endorsed on the policy. Re-assignments of policies are effected in the same manner.

The Act provides a special form of assignment where the policy is surrendered to the company issuing it. There is nothing special about the form. It is merely an acknowledgment of the surrender value and a full release. The Act provides a special form of mortgage which relates to loans advanced by the Department as well as to advances made by outsiders. All such mortgages have to be executed by both mortgagor and mortgagee, unless the mortgage be to the Department or company liable under the policy, in which case, it has to be executed by the mortgagor only. In every mortgage, not being a mortgage to the Department or company liable under the policy mortgaged, certain covenants are implied and have the same effect as if embodied in the mortgage. In the case of mortgages to the Department on its own policies, other covenants are similarly implied and have the same effect as if they had been embodied in the mortgage. It does not necessarily follow that the implied covenants, both in the case of mortgages to the company issuing the policy and to outsiders, are to be rigidly adhered to. There is power under the Act to negative or modify any of the implied covenants or to add others, provided, of course, all such are duly embodied in the mortgage deed. Mortgages

to outsiders are registered by leaving the same duly executed with the policy and a certified copy of the mortgage at the head office of the Department, whereupon the Commissioner, if satisfied that everything is in due form, endorses on such policy a memorandum, as follows:

MEMORANDUM OF REGISTRATION OF MORTGAGE ON POLICY.

Mortgage of the within policy to of
registered this day of 18 at o'clock
in the noon.

Commissioner.

At the same time the following endorsement is made on the mortgage:

MEMORANDUM OF REGISTRATION OF MORTGAGE ON MORTGAGE.

This mortgage, registered this day of 18
at o'clock in the noon.

Commissioner.

The certified copy of the mortgage is retained in the head office of the Department, and the policy and the original mortgage are returned to the person leaving the same. In the case of mortgages to the Department, the same course is followed except that the policy and the mortgage are retained by the Department. Any number of mortgages may be registered against the same policy, taking effect and having priority according to priority of the date of registration. Any mortgagee, when he has sold a policy under the power of sale implied in his mortgage, may execute an assignment of the mortgaged policy, adding words in the assignment purporting that he has sold it in exercise of his power of sale; and thereupon all the provisions of the Act relating to the registration and effect of assignments, apply to such assignment. The Act expressly provides that in such cases neither the Department nor any purchaser from a mortgagee shall be bound to enquire into the propriety or regularity of the sale, or be affected in any way by notice, express, implied, or constructive, that the same is in any way improper or irregular, or be bound or concerned to see to the application of the proceeds of a sale by a mortgagee. Mortgages are discharged by a simple acknowledgment (witnessed in the usual manner) as follows:

This mortgage is hereby discharged (if discharge be only partial state so).
Dated this day of 18 .

A. B.,
Mortgagee.

Signed by the above-named A. B. as mortgagee.
In the presence of C. D. (occupation and address).

Where such discharges have been duly registered by the Commissioner, the policy is released from the mortgage to the extent specified in the discharge.

Any person acquiring a policy through the bankruptcy of the holder, or under a will, or intestacy, or under a writ of execution issued out of any court, may, on production of the policy, together with the evidence necessary to establish his right to such policy, have his title registered by the Commissioner and the policy duly endorsed, and such endorsement vests the policy in such person fully and effectually.

Mortgages of policies may be assigned in exactly the same way as policies. If the Commissioner refuses to register any assignment or document, the person desiring such registration may apply to a Judge of the Supreme Court, who, after hearing evidence, has the power either to order registration or refuse the application. Registration effected in pursuance of a Judge's order has the effect of discharging the Commissioner from any responsibility for the consequences of such registration. The Department and all other persons whosoever are not, except in the case of fraud, affected by notice of any interest whatsoever in any policy which interest is not registered on the policy, and registered dealings with the duly registered assignee or mortgagee of a policy shall not, except in the case of fraud, be capable of being set aside or affected in any manner whatsoever by any such notice. Notwithstanding the provisions of the Act as to registration, nothing contained in the Act operates as a bar to prevent a competent court from enforcing any equities which may exist as between the parties to any transaction or matter relating to any policy, or any interest therein, or any moneys payable thereunder.

In the event of the Department keeping a policy alive out of its surrender value, the Act specifies that all moneys so applied with interest accrued thereon, shall be a first charge on the policy, and the surrender value thereof, and may be deducted therefrom as against any mortgagee or assignee whomsoever.

Provision for Lost or Destroyed Policies or Instruments.

When any policy is lost or destroyed, or when any instrument required to be registered, or the production of which is in any way essential to registration, is lost or destroyed, the Commissioner may, on such evidence and subject to such terms and conditions as he thinks fit, issue a certified copy of such policy, which thereafter takes the place of the lost or destroyed policy, and at the same time becomes the sole evidence of the contract made by the policy, or the Commissioner may effect any registration on such terms and conditions as he shall think fit, notwithstanding the loss or destruction of any such instrument as aforesaid. Prior to the time when the special provision as regards copy policies became law, the Department experienced considerable difficulty in dealing with lost policies. Deadlocks frequently occurred, and it was necessary to obtain bonds in many cases. Under the present law, it is my practice to ask for a statutory declaration before a Justice of the Peace or Solicitor, fully explaining the loss or destruction of the original policy, what steps have been taken to search for the missing document, &c. Upon receipt of such declaration, it is my invariable practice, unless the circumstances are distinctly exceptional, to require the applicant for

the copy policy to deposit the cost of two or three advertisements to be signed by me, setting forth that, unless notice be lodged with me forbidding the issue of a copy policy, I shall proceed to do so, after a certain date, specified in the advertisement.

In the case of a claim where the policy is not forthcoming at the time the ordinary claim papers are lodged, I sometimes ask for a bond to be executed by the executor or administrator, and two sureties indemnifying the Department against loss. In all such cases I ask for suitable statutory declarations, and invariably advertise the loss of the policy, and that I purpose issuing a copy after a specified date. The arrangement works smoothly enough, and I find it a vast improvement on the unsatisfactory state of affairs that previously obtained.

Protection of Policies.

Policies of the Department do not become void by non-payment of premium so long as the surrender-value is not exhausted by any charges thereon. With some few exceptions, the Department's policies are protected from bankruptcy to the extent of £2,000, exclusive of bonuses, or in the case of annuities to the extent of £104 per annum. Such protection does not avail to protect any policy from passing to a trustee in bankruptcy if it be proved to the satisfaction of a Judge of the Supreme Court that such policy was taken out by the bankrupt with intent to defraud his creditors. A holder of a policy whose policy has been protected from bankruptcy, is incapable for three years after his bankruptcy of disposing of the same, except for a paid-up policy, or of mortgaging the same, except for the purpose of keeping the policy in force. The Commissioner in registering an assignment or mortgage, and any person taking an assignment or mortgage of a policy, is not bound to enquire whether the holder of such policy has been bankrupt within three years; and except in the case of fraud, no assignment or mortgage, or registration, shall be capable of being set aside on the ground that it was such a policy as referred to, and that the holder thereof had so assigned or mortgaged it in contravention of the terms of such proviso.

Moneys Payable under a Policy for the Benefit of Minors, &c.

When any moneys become payable under a policy to or for the benefit of a minor, or to or for any person otherwise incapable of exercising his rights, and there is no trustee or person capable of giving a valid discharge, such moneys may be paid to the public trustee of this colony, a member of the Civil Service acting under special Acts of the legislature of New Zealand, unless, of course, another trustee is appointed in due course of law.

If, however, application is made to a Judge of the Supreme Court, the Judge may appoint the public trustee, or any other person, trustee of such moneys on such terms as he may order. Payment by the Department to the public trustee, or to a trustee appointed by the court, is a valid discharge.

Payments without Probate.

In cases where the sum assured, exclusive of bonuses, does not exceed £200, the Commissioner, without requiring probate or letters

of administration, may pay such moneys, together with accrued bonuses, to any person being either the husband, wife, father, mother, child, brother, sister, nephew, or niece of such deceased person, or to any person who can prove himself to the satisfaction of the Commissioner to be entitled to the effects of the deceased person under his will (if any), or under the statutes for the distribution of the effects of intestates, or to be entitled to obtain probate of the will of such deceased person, or to take out letters of administration of his property. In every such case the Commissioner is discharged from further liability in respect of the claim so paid. The Commissioner may, if he thinks fit, require probate or letters of administration to be taken out, and thereupon pay such moneys to the executor or administrator of the deceased. All persons to whom such moneys as aforesaid are paid, are held bound by the Act to apply the same in due course of administration; and, if the Commissioner thinks fit, he may require such persons to give sufficient security by bond or otherwise that the moneys so paid will be so applied, but the Commissioner is not bound to see to the proper application of such moneys.

In conclusion, I may be permitted to say that the progress of the Insurance Department has been of a highly satisfactory character. It began business in 1870, some 30 years after the New Zealand Company established its first settlement at Wellington, where the head office of the Department is situated, and when the population of the colony numbered only 248,000 souls. Since then, what was deemed by some persons a hazardous experiment, has proved a success considerably beyond the expectations of its originators, and judging by the experience of past years, the prospects of the future are replete with promise of still further advancement. By the tables of mortality, as officially reported, the death rate of New Zealand, as might be expected from the salubrity of the climate, is the lowest in any community within the British Dominions, or indeed in the world, and hence arise increased profits, which, with the low premiums and the valuable adjunct of the State security, have obtained for the Department an appreciation and popularity to which the growth of the sum assured, the expansion of the accumulated funds, and the general condition of the institution, bear satisfactory testimony.

Summary of the Law with respect to Life Insurance in New Zealand outside that regulating the Government Insurance Department. *By* J. H. Richardson, F.F.A., A.I.A., *Government Insurance Commissioner, New Zealand.*

The law with respect to life insurance in New Zealand outside that regulating the Government Insurance Department, is embodied in the following Acts:

1873. *No.* 18. *Life Assurance Companies Act.*
1882. *No.* 35. *Sec.* 3. *Companies Act.*
1884. *No.* 10. *Sec.* 13. *Married Women's Property Act.*
1884. *No.* 31. *Life Assurance Policies Act.*
1885. *No.* 20. *Life Assurance Policies Act,* 1884 *Amendment Act.*
1894. *No.* 29. *Foreign Insurance Companies Deposits Act.*
1895. *No.* 37. *Foreign Insurance Companies Deposits Amendment Act.*

No. 18. "Life Assurance Companies Act", 15 September 1873.

Companies, whether established outside the colony or local, and whether established prior to the coming into operation of the Act or not, issuing policies within the colony after the passing of the Act, were required to deposit securities (mortgages on real estate or Government or local body securities, or bank deposits), to the value of £5,000 with the public trustee, a Government official of the colony, and so long as the deposit was less than £20,000, they were required to furnish an annual return to the colonial treasurer of the premiums received on policies registered under the Act with the public trustee, and to deposit in securities 75 per-cent of the premiums, less claims, on such registered policies until the deposit equalled £20,000.

Securities deposited by a company may be exchanged for other securities of equal value, provided due notice is given to the public trustee. The companies receive the income from all deposits.

The public trustee was to hold the securities in trust for the holders of policies which had been duly registered with him. Such registration had to be effected within six months after the issue of the policy.

Since the passing of the Life Assurance Companies Act of 1873, the law as regards deposits has been modified, and the deposits required from foreign companies, that is, companies registered or established out of the colony, or a local company whose chief office is situated out of the colony, are now regulated by "The Foreign Insurance Companies Deposits Act, 1894", particulars of which will be found explained hereafter. That part of "The Life Assurance Companies Act, 1873", relating to the registration of policies with the public trustee, has been repealed by "The Foreign Insurance Companies Deposits Act Amendment Act, 1895" (*vide* saving clause under Foreign Insurance Companies Deposits Act as regards policies already registered).

The public trustee is required to make periodical returns showing, as to each company, the value of the securities deposited, and such information as will enable the present value of the policies charged thereon to be calculated.

Statements of revenue and balance sheets are required annually in forms similar to those of the English Act of 1870. The life assurance fund is required to be kept separate where the company does business other than that of life assurance, and such fund is as absolutely the security of the life and annuity policyholders as though it belonged to a company carrying on no other business than that of life assurance. Valuation statements are required once in 10 years from companies established before the passing of the Act; every five years from companies established thereafter. If companies have an actuarial valuation oftener than every five years, returns have to be furnished whenever such valuations are made.

In addition to these returns, companies are required to furnish a statement very similar to that required in the sixth schedule of the English Act. If companies value annually, they need only supply the statement triennially. The colonial treasurer of the colony has power to modify the forms of the various returns, &c., should he think it expedient so to do. The original and three printed copies of every statement are required to be furnished. Penalty of £50 per day for default. If default continue for a period of three months after notice of default by colonial treasurer, the Supreme Court of the colony may order the winding-up of the company upon the application of one or more policyholders or shareholders.

Certain companies may also be wound up on the application of one or more policyholders or shareholders, if it is proved that they are unable to satisfy a 4 per-cent net valuation according to the "combined experience" or "actuaries" rate of mortality. In the event of a company being proved to be insolvent, the court has power to reduce the amount of the contracts of the company upon such terms and subject to such conditions as it thinks just, in place of making a winding-up order. Foreign companies are to appoint agents, upon

whom all lawful processes against the company may be served, and all contracts issued by the company are to expressly state that the decisions of the court will be abided by.

Married women may effect policies as if sole, and dispose of interests in contracts by will without husband's consent.

No. 35. *Companies Act,* 1882.

No insurance company with limited liability shall be registered. For the purposes of the Act, a company that carries on the business of insurance in common with any other business or businesses shall be deemed to be an insurance company.

No. 10. *Married Women's Property Act,* 1884.

A wife may insure her own or her husband's life for her separate use. Moneys payable under a policy expressed to be for the benefit of wife and children or either, or husband and children or either, are not, except in case of fraud, to form part of the ordinary estate of the insured, so long as any object of the trust remains unperformed, nor be subject to the debts of the insured.

No. 31. *Life Assurance Policies Act,* 1884.

The secretary mentioned throughout means the principal officer of the company, or the Government Insurance Commissioner.

Assignments and Mortgages of Policies.

No company shall be bound to receive, or be liable in any way to be affected by express, implied, or constructive notice, however given, of any trust affecting any policy. Assignments and mortgages (special forms for which are provided under the Act), are not to be valid unless registered. Assignments are registered on leaving the policy with the transfer endorsed thereon at the office of the company, and a mortgage is registered on leaving the same, together with the policy and a certified copy of the mortgage. Assignments are to be absolute, and trusts to be effected by some separate instrument.

Mortgages.

The usual covenants, if not expressly negatived or modified, are implied. A mortgagee who has sold a policy under a power of sale may execute an assignment. No purchaser or company registering the assignment is bound to enquire into the regularity of the sale, or to be affected by notice, or to be concerned to see to the application of the proceeds of the sale. A title acquired by bankruptcy, will, or intestacy, or writ of execution, is registered by the secretary on production of the necessary evidence of title. The secretary, before registering documents, may require proof of signatures. If the secretary should refuse, for any reason whatsoever, to register any document, registration may be ordered by a Judge of the Supreme Court. Any registration effected in pursuance of and in conformity

with a Judge's order shall discharge the secretary and his company from any responsibility or liability whatsoever, for the consequence of such registration. Notices of unregistered dealings are not to affect the company or purchasers, except in the case of fraud.

Lost Policies.

The secretary may, on such evidence, and subject to such conditions as he thinks fit, issue a certified copy of any policy, which, for all purposes of the Act, shall take the place of the policy lost or destroyed.

Notwithstanding the provisions of the Act as to registration, nothing contained therein shall operate to prevent any competent court from enforcing any equities which may exist as between the parties to any transaction or matter relating to any policy or interest therein, or moneys payable thereunder.

Companies may apply the surrender-values to keep policies in force, and any moneys so applied, with accrued interest thereon, shall be a first charge on moneys payable under the policies.

Protection of Policies.

Policies are to be kept in force so long as the premiums and interest in arrear and other charges are not in excess of the surrender-value as declared by the company in answer to the 10th question of the sixth schedule to "The Life Assurance Companies Act, 1873."

Policies are protected, in the event of bankruptcy, up to £2,000 of insurance, exclusive of bonuses, or in the case of annuities, to the extent of £104 per annum. Such protection is not to apply to policies taken out with the intention of defrauding creditors, and policyholders are prohibited from disposing of their policies for three years after bankruptcy. They may, however, take a paid-up policy or mortgage a policy for the purpose of keeping it in force. Assignments are not to be void if registered without notice of previous bankruptcy.

Insurance by Parents on the Lives of Children.

Children under five years of age are not to be insured in the aggregate, whether in a friendly society or otherwise, for more than £6, or under 10 years of age, for more than £10. The money is to be paid, only to the parent of the child, on production of a special certificate of death. These provisions are not to apply to children's endowments, with or without return of premiums.

Moneys payable under a Policy for the Benefit of Minors, &c.

Moneys payable to minors or persons incapable of giving discharges, may be paid to the public trustee of the colony unless a trustee is appointed. The Supreme Court may appoint a trustee.

Payments without Probate.

Assurances under £200 may be paid without requiring probate or letters of administration to any person, being either the husband, wife, father, mother, child, brother, sister, nephew, or niece of such deceased person or to any person who can prove himself, to the satisfaction of the company, to be entitled to the effects of the deceased person under his will (if any) or under the statutes for distribution of the effects of intestates, or to be entitled to obtain probate of the will of such deceased person or to take out letters of administration of his property, and the company so paying them is discharged from further liabilities or from seeing to the application of the money.

Settlement Policies,

Settlement Policies for the benefit of children, or wife and children, issued under the New Zealand Government Insurance and Annuities Acts, or the Life Assurance Companies Act of 1873, may be apportioned by deed or will. If not apportioned, parties interested share alike. The words "wife and children" are defined to be the wife and children, if any, living at the death of the assured. Wife's name may be inserted in policy where not named, and changed on re-marriage. Apportionment is valid although beneficiaries are not all included. On the death of the whole of the beneficiaries, the benefit of the policy reverts to the assured. Beneficiaries, if of age, may join in an assignment of policy. On reversion, assured may deal with policy as his own. Assured may borrow on the policy for the purposes of keeping it in force. Assured, with wife's consent, may mortgage a settlement policy.

Annual Statements by Companies.

An annual statement is required, in the form attached,* of the policies issued and discontinued, and of the balance in force, both for the companies' total business and their New Zealand business. The revenue accounts and balance sheets required under the Life Assurance Companies Act of 1873, are required for the New Zealand business as well. Five months are allowed for depositing returns relating to New Zealand, after the close of the financial year, while under the Act of 1873, nine months are allowed for returns relating to the total business.

1894. *No.* 29. *Foreign Companies' Deposits.*

Every foreign life assurance company which proposes to commence business in the colony, after the passing of the Act, or is already established in the colony, is required to deposit with the public trustee a sum of not less than £5,000, or more than £50,000 in cash or approved securities. The deposit in the case of life companies, is to be £5,000 where the amount assured by current policies does not exceed £100,000, and five thousand (£5,000) for each additional £100,000 until the total of £50,000 is deposited either in cash or recognized securities. The deposit is deemed to be a compulsory deposit within the meaning and for the purpose of "The Life Assurance Companies Act, 1873."

* *See* pages 218–219.

Accident and Miscellaneous Insurance Companies.

If in business in the colony prior to the passing of the Act, a deposit of at least £5,000 is required, increasing with the business to £10,000. Any such new company is required to deposit £10,000 forthwith.

General.

Companies are not required to make more than one deposit under the Act. Receipts of premiums in respect of past contracts only are not deemed a continuance of business. Where deposits are under the maximum, further deposits are to be made as business increases, and a return of insurance is to be furnished to the colonial treasurer half-yearly. Cash deposited with the public trustee is to bear interest. The company is to receive the income or interest arising from the deposit. Deposits may be changed for other approved securities of equal value. Deposits to be held in trust for policyholders, but without prejudice to the special trust, in favour of policies registered under "The Life Assurance Companies Act, 1873." Deposits are not to be liable for the debts of companies, without the consent of the colonial treasurer, until all the obligations in the colony in respect of policies or contracts are cancelled, annulled, or liquidated. The penalty for default in complying with the Act is £50 a day. If the default continues, the company may be prohibited from carrying on business. Foreign companies may withdraw from business, in the colony, on satisfying the public trustee that all the liabilities of the company in the colony are liquidated or provided for. The public trustee is to furnish a statement to Parliament, each session, showing the value and nature of the securities deposited by each company. The Act is to be read with the "Life Assurance Companies Act, 1873."

Statement of Policies Issued, Discontinued, and Existing in the..... during the year ended.....

—	Assurance				Endowment				Annuity			
	No. of Policies	Sum Assured	Single Premium	Annual Premium	No. of Policies	Sum Assured	Single Premium	Annual Premium	No. of Policies	Amount of Annuity per Annum	Consideration received	Annual Premium
Total policies in force at beginning of year ...												
Policies issued during the year												
Totals												
Policies discontinued during the year												
Total policies existing at end of year ..												

Particulars of Policies Discontinued.

How Discontinued	Assurance			Endowment			Annuity		
	No. of Policies	Sum Assured	Annual Premiums	No. of Policies	Sum Assured	Annual Premiums	No. of Policies	Amount of Annuity per Annum	Annual Premiums
		£	£ *s.* *d.*		£	£ *s.* *d.*		£ *s.* *d.*	£ *s.* *d.*
By Death ...									
„ Maturity									
„ Surrender									
„ Lapse ...									
„ Change ...									
Other causes									
Totals ...									

Progress of the Business of the.....since its Establishment to.....

——	No. of Policies	Sums Assured	Annuity per Annum	Annual Premiums
		£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*
Total issued				
Total discontinued ...				
Total existing ...				
Annual income from interest				
Total annual income				

Legislation affecting Life Assurance Contracts and Life Assurance Companies in Cape Colony. *By* James McGowan, F.I.A., *Colonial Government Actuary.*

1. The principal Acts affecting life assurance companies in Cape Colony are—

I. The Stamp Acts Amendment Act 1887, and
II. The Life Assurance Act 1891.

I.

2. Section 11 of the Act of 1887, requires every insurance company, with certain exceptions, to take out an annual license on which there is payable sixpence for every pound sterling or fraction of a pound sterling on the premiums received in the Colony by such company during the preceding year ending the 31 December. The minimum amount of license duty is £30. The maximum £500.

3. Section 12 of the same Act, requires the companies to supply returns for the purpose of ascertaining the amount of duty payable.

4. In accordance with Section 14 of the same Act, every company "whose head office or place of business is or shall not be situated within this colony", carrying on the business of fire, marine, accident or life assurance, is required to deposit, with the treasurer, securities to the value of £10,000.

II.

5. The Life Assurance Act of 1891 requires life companies to lodge returns with the Government, much in the same way as returns have to be lodged by the companies with the Board of Trade in England.

6. A company commencing life business has to notify in the *Gazette* the name of its principal officer in the colony and the address of the principal office.

7. Section 16 of the Act is of considerable importance. It provides that "the property and interest of every person under any policy of "assurance upon his own life, and which shall have endured for not "less than three years from the date of the payment of the first "premium thereon; or in any moneys payable thereunder, shall not "be seized or taken in execution under any process of court, or in the "event of the sequestration of the estate of such person as insolvent "shall not vest in the trustee, or otherwise, for the benefit of the "creditors of his estate, subject, however, to the conditions or "limitations following—

"(1) If such assurance shall have endured three years or "upwards, it shall be protected as aforesaid, to the extent of

"three hundred pounds; and in addition thereto, one
"hundred pounds for each additional year or part of a year,
"not exceeding in any case the sum of two thousand pounds.
"(2) The sums of money aforesaid shall mean sums assured
"by one policy or several policies, irrespective of any bonus
"or other additions thereto.
"(3) If the assured can, by the terms of his policy, surrender
"the same to the company, and agrees with the company to
"surrender the policy, then the money which shall be payable
"upon such surrender shall not be protected as hereinbefore
"provided: but nothing herein contained shall be construed
"to prevent the assured from agreeing with the company,
"for the surrender or exchange of his existing policy, for a
"fully-paid up policy equivalent to its value, which latter
"policy shall have the protection afforded by this section."

8. Attached to the Act is a schedule showing the form in which companies are to supply returns (1) of the new policies issued, (2) the policies discontinued, and (3) the policies existing.

Des diverses Législations sur le Contrat d'Assurance sur la Vie, au Point de Vue international.

PAR HENRI ADAN.

I.

La huitième question inscrite au programme du premier Congrès d'actuaires, réuni à Bruxelles, portait:—

" Étude des dispositions légales en vigueur ou en préparation dans " les divers pays, relativement aux Compagnies d'assurances sur la vie, " plus spécialement en ce qui concerne les cautionnements, dont le dépôt " est exigé par les gouvernements et les impôts dont sont frappées les " primes."

Plusieurs rapports, notamment celui de notre honorable collègue Mr. Harding, ont répondu à la question ainsi posée.

Aujourd'hui, elle est portée au programme du Congrès de Londres, dans des termes plus larges, elle vise 1° les rapports de chaque législation civile ou commerciale, avec le contrat d'assurance sur la vie, conclu par une institution d'assurance d'une nationalité, sur le territoire et avec des assurés d'une autre nationalité.

2° Les mesures législatives appliquées aux institutions d'assurances de certaine nationalité, étendant leurs opérations hors de leur territoire indigène.

Nous nous plaisons néanmoins à rappeler ici, les travaux antérieurs que nous venons de citer et pour leur rendre un légitime hommage et pour signaler la contribution qu'ils ont déjà fournie dans l'exposé de la question.

Je m'abstiendrais de relever les vastes proportions de celle-ci, telle qu'elle se pose aujourd'hui, s'il ne me semblait impossible de l'enserrer dans le cadre d'un Rapport qui ne peut excéder certaines limites.

L'introduction historique du sujet, à elle seule serait de nature à comporter une étude considérable.

J'ai donc à solliciter une excessive indulgence pour excuser l'insuffisance et les notables lacunes que comporte mon travail, en présence des proportions de la question envisagée et de la méthode de traitement qu'elle exigerait.

II.

Au point de vue de la législation régissant le contrat d'assurance sur la vie, on observe des diversités de réglementations notables en divers pays.

Dans certaines contrées (en Allemagne, en Suisse, par exemple) on rencontre depuis longtemps dans le droit civil, des dispositions appelées à régir cette convention, soit plus ou moins parfaitement, soit plus ou moins complètement.

Dans d'autres (Belgique, Hongrie, Hollande, Italie), il est intervenu des dispositions spéciales, appelées à proclamer la légalité du contrat et à le réglementer, avec le désir de tenir compte de sa nature particulière.

Dans d'autres encore (en Allemagne, en Suisse) on s'apprête à lui préparer une législation nouvelle.

Dans d'autres enfin (en France), il semble que l'on croie devoir temporiser encore et abandonner les destinées du contrat aux fluctuations d'une jurisprudence, qu'on ne considère sans doute point comme suffisamment fixée.

Nous croyons donc que l'on peut dire d'une manière générale avec Ehrenberg (tome i. " Das Versicherungsrecht," p. 41) :

" Tandis que la science des assurances a atteint une perfection " technique, une activité pratique, sans égale, le droit qui est appelé " à lui fournir appui et sûreté, se trouve dans un regrettable état " d' infériorité, d'insuffisance intrinsèque et extrinsèque."

M. le Conseiller von Knebel Dobcritz s'exprimait dans le même sens à Berlin le 29 mars 1897, en installant la Commission technique prussienne des assurances, instituée par arrêté ministeriel du 13 octobre 1896 (*Zeitschrift des Koniglich preussischen Statistischen Bureau.* Erganzungsheft xix., p. 3).

Le développement du droit en matière d'assurance sur la vie, est en effet loin d'avoir marché du même pas, que la science mathématique, qui avait donné le jour à cette admirable et ingénieuse institution.

Il n'est pas sans intérêt au point de vue des variétés indigènes de législation et de leurs effets internationaux, de chercher à se rendre quelque compte des causes efficientes, de cette allure généralement tardigrade du mouvement législatif.

Et, comme c'est en France que nous trouvons une situation absolument vierge encore, en matière de législation spéciale réglementant le contrat, il semble qu'on y pourrait peut être recueillir d'utiles indications, propres à mettre particulièrement en lumière, l'action des éléments qui retardent ou troublent l'initiative du législateur, en présence d'un contrat, dont la pratique est cependant devenue universelle.

Dans une brillante conférence donnée sur la formation de la craie, à l'Association britannique pour l'avancement des sciences sociales à Norwich, Huxley exposait, démontrait, que la terre avait été depuis longtemps le théâtre d'une série de changements aussi lents que considérables.

L'opinion formulée par l'illustre savant au sujet des modifications de notre globe terrestre, peut s'étendre au monde économique, au monde juridique.

Cette idée se renforce lorsqu'on jette un coup d'œil sur les rapports parallèles du droit et de l'économie politique, lorsqu'on assiste à la transformation lente, mais continue du premier, sous l'influence innovatrice, persistante, parfois indirecte, parfois occulte de la seconde.

Si Rossi croyait pouvoir écrire en 1857, qu'à la promulgation du Code Civil Français (1803–1804), la révolution sociale était accomplie par la destruction du privilège, il ajoutait que sa révolution économique était loin du terme de sa carrière (" Mélanges d'Économie politique, d'Histoire et de Philosophie," t. ii., pp. 18 et 44. Paris, Guillaumin, 1857).

Et, résumant sa pensée, il disait :

" Nos codes, par le cours naturel des choses, se sont trouvés placés " entre deux faits immenses, dont l'un les a précédés, dont l'autre les a " suivis, la révolution sociale et la révolution économique.

" Ils ont pu régler le premier, ils n'ont pu régler le second.

" Il y a donc, sans qu'on puisse en faire reproche à personne, une " lacune à remplir, une harmonie à rétablir entre notre droit privé et " notre état économique."

Cette harmonie doit procéder de l'accord, de l'action combinée, de l'économie politique et du droit.

Or, parmi toutes les innovations économiques, qui ont suivi la promulgation du Code Civil Français, il n'en est pas beaucoup qui aient constitué autant que le contrat d'assurance sur la vie, une conception d'un caractère original, dont la nature primesautière se distinguait aussi vivement de celle des conventions issues du droit romain ou du droit coutumier ultérieurement réglementées par le Code.

Nous l'avons déjà dit, la conception du contrat d'assurance en cas de décès, n'était pas moins troublante pour les classifications du Code Civil, que l'ornithorynque pour les classifications de Cuvier.

Aussi l'harmonie à établir entre la loi civile et la loi qui tiendra compte de la nature spéciale et des nécessités de l'assurance en cas de décès, se fait elle attendre ou demeure-t-elle insuffisante, suivant les facilités ou les difficultés plus ou moins grandes de conciliation du droit civil local, avec la nature spéciale de cette assurance, suivant les connaissances plus ou moins approfondies de la matière, par les législateurs.

Il n'est donc pas bien étonnant que Rossi, passant en revue les défaillances du Code Civil Français, et reconnaissant que celles-ci s'accusaient plus spécialement dans sa partie quasi matérielle, dans celle qui traite des biens, indépendamment de l'état des personnes, ait signalé le législateur du Code comme s'étant trouvé au dessous de sa tâche, quand il s'est vu aux prises avec les principes des sciences économiques, spécialement lorsqu'il s'est occupé des manières dont on garantit la propriété.

C'est ce qui l'amenait à dire :

" Parmi les sociétés industrielles, il n'en est guère de plus utiles, que " celles qui ont pour but les assurances.

" Les assurances enlèvent au malheur sa funeste puissance, en " divisant ses effets. L'intérêt s'ennoblit en prenant en quelque sorte " les formes de la charité. Par les assurances, les entreprises les plus " hardies, n'offrent que très peu de dangers ; les plus terribles fléaux " perdent leur horreur ; et plus d'un père de famille à son lit de mort,

" doit aux assurances sur la vie le bonheur ineffable de pouvoir fixer sans " angoisses ses derniers regards sur sa femme et sur ses enfants.

" Cependant, si l'on en excepte les assurances maritimes, on ne " trouve pas dans nos codes une seule disposition sur cette matière si " importante.

" C'est en partie au silence de la loi, qu'on doit attribuer l'indifférence " du public pour une institution aussi utile aussi morale que celle des " assurances sur la vie. L'égoisme et l'ignorance trouvent une sorte de " justification dans le silence du législateur. Ils négligent ce que le " législateur parait avoir méprisé. . . ."

Nous avons jugé utile de rapporter ces déclarations de Rossi, parceque nous croyons qu'elles accusent assez exactement les origines des hésitations, que nous voyons encore persister en France, malgré les brillants efforts déjà déployés, pour mettre fin à un état de choses regrettable.

Deux faits récents nous semblent confirmer la permanence de ces hésitations.

L'un se dégage du travail produit par M. Paul Bailly (*Moniteur des Assurances de Paris* du 15 octobre 1897) en examinant les importantes dispositions du nouveau Code Civil Allemand, relatives à l'assurance sur la vie et aux dispositions au profit d'un tiers, conçues comme suit :

330. Wird in einem Lebensversicherungs oder einem Leibrentenvertrage die Zahlung der Versicherungssumme oder der Leibrente an einen Dritten bedungen, so ist im Zweifel anzunehmen, dass der Dritte unmittelbar das Recht erwerben soll die Leistung zu fördern.

Das Gleiche gilt, wenn bei einer unentgeltlichen Zuwendung dem Bedachten eine Leistung an einen Dritten auferlegt oder bei einer Vermögens- oder Gutsübernahme von dem Uebernehmer eine Leistung an einen Dritten zum Zwecke der Abfindung versprochen wird.

331. Soll die Leistung an den Dritten nach dem Tode desjenigen erfolgen, welchem sie versprochen wird so erwirbt der Dritte das Recht auf die Leistung im Zweifel mit dem Tode des Versprechensempfängers.

Stirbt der Versprechensempfänger vor der Geburt des Dritten, so kann das Versprechen an den Dritten zu leisten, nur dann noch aufgehoben oder geändert werden, wenn die Befugniss dazu vorbehalten worden ist.

Art. 330.—Si dans un contrat d'assurance sur la vie ou de rente viagère, on a stipulé le paiement du montant de l'assurance ou de la rente à un tiers, en cas de doute le tiers acquiert immédiatement le droit d'exiger la prestation. Il en est de même, lorsque dans une disposition gratuite, l'on impose au gratifié, une prestation à faire à un tiers, ou lorsque dans une cession de patrimoine ou de biens, le cessionnaire, en vue de se libérer, promet une prestation à un tiers.

Art. 331.—Si la prestation en faveur du tiers doit avoir lieu après la mort du stipulant, en cas de doute le tiers acquiert le droit à la prestation, à la mort de ce stipulant.

Si ce dernier meurt avant la naissance du tiers, la promesse de faire la prestation au tiers ne peut plus être modifiée ou supprimée que " si la faculté de le faire a été réservée."

Or, on sait que les controverses sur la question des dispositions, pour autrui, peuvent se résumer en deux théories, l'une représentant la stipulation pour autrui comme une offre du stipulant, ou, du contractant au tiers bénéficiaire qui n'acquiert de droit, que par son acceptation—

l'autre admettant que le tiers bénéficiaire, bien qu'étranger au contrat, acquiert un droit né à son profit de la convention faite à son insu et sans sa participation.

M. Bailly a très heureusement remis en présence les deux théories, les arguments produits en leur faveur et contre chacune d'elles, voir même ceux que certains entendent puiser dans les principes rationnels du droit romain contre l'engagement unilatéral admis par le législateur allemand, de même qu'en matière de titre à ordre, de titre au porteur (Art. 130, 131, 794, 795 du nouveau Code Civil Allemand).

Le second fait réside dans une récente discussion sur les rapports du droit et de l'économie politique qui s'est déroulée à la Société d'Économie politique de Paris et au cours de laquelle on a vu invoquer encore un bagage d'arguments surannés, pour les opposer à une autorité de la valeur de Mr. Lyon Caen, alors qu'il signalait la jurisprudence française éclairée, inspirée par l'économie politique et proclamant que le capital constitué à un bénéficiare par un assuré, ne fait pas partie du patrimoine du dit assuré.

En Belgique la loi du 11 juin 1874, a malheureusement été élaborée par une Commission composée d'hommes fort distingués sans doute, mais parmi lesquels ne se rencontrait aucun assureur, aucun homme technique dans la branche spéciale des assurances sur la vie.

Aussi la lecture des procès-verbaux de la commission, la lecture des débats parlementaires qui ont précédé la loi, accusent elles souvent l'arriéré d'allure, les méprises de la science juridique, quand elle touche à ces assurances.

Nous relèverons seulement ici, que la terminologie de la loi pour cette catégorie d'assurance est fréquemment vicieuse au point de vue de la qualification des parties dans le contrat (art. 1), que sa rédaction est insuffisante ou vague en ce qui concerne les conditions de rachat et d'annulation (art. 10), qu'elle est peu lucide en matière de privilège (art. 23) ; mais qu'elle a eu un véritable caractère progressif auquel nous tenons à rendre hommage (art. 413), en proclamant à l'exemple de l'art. 1757 de la loi zurichoise, et de la *Married Women's Property Act* de 1870, que la somme stipulée payable au décès de l'assuré appartient à la personne désignée dans le contrat.

Il est seulement regrettable à notre sens, que le même article ait subordonné la pleine attribution de ce capital à l'application des règles de droit civil relatives au rapport et à la réduction (art. 920—1468s, Code Civil).

Nous croyons qu'il eut été utile d'apporter un tempérament à cette application qui peut mener à l'annulation complète des intentions du stipulant, en ne l'autorisant que dans le cas où les primes n'auraient pas été prélevées seulement sur les revenus du preneur d'assurance et assuré.

Il semble en effet, que dans ces limites, ce prélèvement mérite bien les égards que l'on accorde forcément aux consommations improductives de revenus ou à leur scandaleuse dissipation.

Et cette détermination ne serait vraiment pas plus difficile, que l'évaluation à laquelle le tribunal doit se livrer dans le cas de l'art. 208 du Code Civil, quand il est appelé à fixer la proportion d'une pension alimentaire suivant la fortune de celui qui la doit.

Par contre, il est fâcheux que la loi belge en cet article, n'ait pas décidé, à l'exemple de la loi anglaise précitée, que s'il est prouvé que la

police a été conclue avec l'intention de frauder les créanciers, ceux-ci auront le droit de prélever sur le capital une somme égale au montant des primes payées.

Enfin, au dessus de ces défauts, il en plane un autre plus général, plus grave et qui nous semble reprochable à toutes les lois, à tous les projets de loi produits jusqu'ici. C'est de ne pas réserver à ce contrat l'honneur d'un cadre spécial, ou d'un chapitre spécial traitant complètement et exclusivement cette assurance dont la complexion est si délicate, au lieu de le cantonner dans une section de proportions plus ou moins modestes, en prétendant le soumettre aux dispositions générales du contrat d'assurance contre les risques élémentaires, avec lesquelles sa nature propre exceptionnelle se trouve souvent en dissonance plus ou moins aiguë.

Cette prétention semblera peut-être excessive aux yeux de bien des juristes; mais nous avons confiance dans la bonté de notre cause, quand nous voyons le législateur se préoccuper de réglementer avec tant de soin (V. art. 711 et s., Code Civil) la transmission de la fortune de ceux qui en ont, alors que nous réclamons la même sollicitude pour l'assurance sur la vie, la fortune de ceux qui n'en ont pas (Reboul).

En Hollande il suffit de rappeler les difficultés que la réforme appelée à proclamer la légalité de l'assurance pour la vie entière à rencontrées avant d'aboutir à la révision de l'art. 302 du Code de Commerce, pour y trouver aussi les témoignages irrécusables des hésitations, des tâtonnements du législateur (voir *Moniteur des Assurances de Paris*, Année 1872 et 1875, p. 134).

En Suisse plus récemment, en 1893, estimant avec raison que les dispositions du Code Civil Zurichois ne répondaient pas suffisamment aux nécessités du contrat d'assurance sur la vie, le Gouvernement fédéral a nommé une commission spéciale aux fins de préparer un projet de loi fédérale non seulement sur ce contrat, mais sur le contrat d'assurance en général.[1]

Nous estimons que toute loi bien conçue doit comprendre une définition exacte de son objet, car nous pensons que cette définition doit passer du domaine téchnique dans le domaine juridique.

Nous eussions donc désiré voir introduire dans la loi, une définition précise de l'assurance en cas de décès, et nous trouvons qu'il eut été désirable de donner, non seulement une définition du contrat, une définition de la réserve de prime (Deckungskapital) mais de qualifier dans la loi, le titre auquel celle-ci se trouve aux mains de l'assureur légalement parlant.[2]

Les considérations développées dans le Rapport de Mr. Roelli à l'appui de l'art. 81 du projet n'ont pas touché ce point, qui nous semble cependant posséder une importance considérable.

[1] Cette commission se composait de MM. Cornaz, juge à Lausanne; Grossmann, Directeur de l'Helvetia à St. Gall; Eugène Huber, professeur Dr. à Bern; Kinkelin, professeur Dr. à Bâle; Kummer, D. Directeur de l'office fédéral des assurances; Lienhard Standerat à Berne; Dr. Rehfous, avocat à Genève; Dr. Lev. Weber, Secrétaire pour la Législation et le Département de la Justice; enfin le Dr. Roelli, Professeur attaché à l'Office des Assurances comme juriste et rapporteur du projet déposé au Conseil fédéral.

Mr. le Dr. Roelli signalait comme lui ayant en outre prêté concours officieux MM. Schoertlin, Directeur de la Schweizerischen Lebensversicherungs und Renten Anstalt; MM. Frefzer et Rosselet, mathématiciens de l'Office des Assurances.

[2] La nouvelle théorie de Mr. le Professeur Gobbi (*Revue Internationale des Assurances*, t. i., p. 10 et 206) rend cette definition plus desirable que jamais.

L'art. 81 du projet de loi fédérale sur le contrat d'assurance, élaboré par la Commission nommée en 1893 par le Gouvernement helvétique stipule en effet que : " la valeur de réduction ou le prix de " rachat de l'assurance, sont fixés d'après la réserve existant au " moment où la demande de réduction ou de rachat, est parvenue à " l'assureur."

" On entend par réserve au sens de la présente loi, le montant dont " l'assureur sur la vie suivant ses bases techniques et en outre des primes " futures, *doit pouvoir disposer* (nötig hat) pour faire face à ses charges " probables."

Nous estimons qu'en présence de la négation de sa nécessité dans certaines sphères, des controverses soulevées sur sa nature, sur l'attribution de sa propriété dans d'autres sphères, il est désirable que l'attribution de la propriété du fonds de réserve de primes soit déterminé par la loi.

Nous attachons à la détermination de ce titre une importance majeure au point de vue des conditions de traitement de la réserve de primes, par l'effet plus ou moins direct des lois générales civiles, commerciales et fiscales de chaque nation. Ce n'est certes pas ici qu'il est nécessaire d'exposer comment les assureurs ont combiné une sorte de nivellement, en introduisant un système de primes *uniformes*, constantes, en vertu duquel le preneur d'assurance ne doit payer qu'une prime invariable durant toute sa vie.[1]

Mais, comme le système ne pouvait se soustraire aux imprescriptibles exigences des lois naturelles, comme il devait tenir compte des nécessités procédant de la future et progressive aggravation du risque de mortalité, la prime uniforme, supérieure au coût du risque annuel au début, devenait ensuite inférieure à ce coût.

Il en résultait que la solvabilité de l'assureur devait être sauvegardée par la mise en réserve de la quotité des excédents sur le coût du risque d'un an perçus dans les premières années de l'assurance, pour arriver à compenser plus tard l'insuffisance accusée par l'écart entre la prime annuelle, constante invariable, et la prime naturelle ascendante d'année en année, parallèlement à la progression d'âge.

La constitution du fonds de réserve de primes dans les assurances sur la vie, n'a pas d'autre source, n'a pas d'autre cause, n'a pas d'autre but.

C'est donc au moyen d'un sacrifice plus fort dans le début, au moyen d'un véritable forfait que le preneur d'assurance et assuré obtient la permanence, l'uniformité constante du taux de la prime si prolongée que soit son existence.

C'est d'autre part moyennant ce même contingent, que l'assureur s'engage à ses risques et périls, à placer, à faire fructifier les excédents perçus les premières années, pour compenser les insuffisances des années ultérieures.

De ces considérations, il nous semble bien acquis, que l'on peut formuler cette proposition : " *La réserve de primes est la propriété de l'assureur.*"

Cependant il a été affirmé que la réserve de primes était la propriété

[1] Voir *Moniteur des Assurances de Paris*, de janvier 1885, p. 7, et *Belgique Judiciaire* 1890, p. 421.

de l'assuré, devait être considérée comme propriété de la *collectivité des assurés*, soumise à certaines servitudes.[1]

Nous estimons que c'est là une erreur absolue, à moins qu'il ne s'agisse de Société mutuelle dans laquelle les assurés sont en même temps assureurs, auquel cas l'être moral constitué par la collectivité est propriétaire comme assureur et non comme assuré.

Il a encore été prétendu, que la réserve ne serait point, à *proprement* parler, la propriété de l'assuré, mais on repoussait l'attribution de cette propriété à l'assureur.

À cela nous objectons, qu'il n'existe pas deux espèces de propriété : l'une qui serait la vraie à proprement parler, et l'autre qui ne le serait pas. Nous ajoutons qu'en cette matière il faut bien s'incliner devant les principes du droit, souverainement traduits par l'article 544 du Code Civil. Que, par suite, si la réserve n'est pas la propriété du preneur d'assurance, elle ne l'est pas du tout ; que si l'on refuse son attribution à l'assureur, elle se trouverait devenir un bien vacant, un bien sans maître tombant dans le domaine public (art. 539 du Code Civil).

Il est bien entendu que nous ne songeons cependant pas, un seul instant, à contester l'impérieuse rigueur des obligations de l'assureur, en ce qui concerne la constitution du fonds de réserve de primes ; ses obligations de ce chef ne font pas l'ombre d'un doute.

Mais, nous prétendons qu'il faut distinguer la nature des rapports de droit que l'on rencontre dans l'espèce.

Ces rapports sont de deux natures absolument différentes ; les uns constituent des droits *réels*, les autres constituent des droits *personnels*.

On sait que le droit *réel* est celui qui crée entre la personne et la chose une relation directe et immédiate, de telle sorte qu'on n'y trouve que deux éléments, savoir la personne qui est le *sujet* actif du droit, et la chose qui en est l'*objet*—il existe, indépendamment de toute obligation spéciale d'une autre personne. On sait d'autre part, que le droit *personnel* est celui qui crée seulement une relation entre la personne à laquelle le droit appartient, et une autre personne qui est obligée envers elle.

En vertu du droit personnel, un tiers ne peut se porter directement sur la chose même ; il faut s'adresser à une personne spécialement obligée envers ce tiers, à raison de cette chose.

La cause efficiente du droit personnel, c'est l'obligation toujours et uniquement l'obligation.

La cause efficiente du droit réel, c'est l'aliénation.

Nous estimons que du chef des engagements pris par l'assureur, du chef des sûretés par lui promises au preneur d'assurance, notamment en ce qui concerne les conditions constitutives du fonds de réserve de primes, ce preneur d'assurance n'a contre l'assurance qu'une action purement personnelle, une action fondée sur un pacte de rachat, sous condition résolutoire de l'assurance, tandis que l'assureur détenteur en droit et en fait de la réserve, en est le légitime propriétaire et possède sur la réserve un droit direct, immédiat, réel.

C'est en vertu de ce droit que, pour constituer le fonds de réserve de primes, l'assureur, à l'aide des primes reçues en espèces, qu'il fait

[1] Il faut supposer que l'emploi de l'expression *assuré*, celui sur la tête duquel l'assurance repose, implique dans l'espèce que cet assuré est en même temps *preneur d'assurance* ou contractant.

siennes, qu'il consomme comme choses fongibles, use du droit du propriétaire en les employant en titres, en prêts hypothécaires par exemple, consentis en son nom à lui assureur, en immeubles acquis en son nom à lui assureur, et non pas au nom du preneur d'assurance.

Il n'est pas plus admissible de prétendre que cette propriété de l'assuré constituerait un dépôt chez l'assureur.

Le dépôt, aux termes de l'article 1915 du Code Civil, est un acte par lequel on reçoit la chose d'autrui, à la charge de la garder et de la restituer en nature.

C'est à dire que la tradition doit avoir pour fin la garde de la chose.

Or, comment concilier, dans l'hypothèse du dépôt, l'emploi que l'assureur va faire et doit faire de la prime reçue, avec les obligations du dépositaire inscrites dans les articles 1927 et suivants du code, spécialement avec celle qu'implique, l'article 1932, qui oblige le dépositaire à restituer les choses, mêmes reçues en dépôt *in individuo*.

Il n'existe en aucune façon, entre le preneur d'assurance et l'assureur, un contrat de dépôt; il y a entre eux un contrat d'assurance, et ce contrat, absolument comme le contrat de rente viagère dont il est l'envers, implique un contrat de vente.

L'assureur vend la sécurité.

Le preneur d'assurance l'achète moyennant une prime qu'il aliène comme prix de la sécurité comme prix de l'assurance.

Nous prétendons donc que la prime d'assurance est chose totalement *aliénée* au profit de l'assureur et pour la portion appelée à couvrir le risque annuel, et pour la portion appelée à couvrir le risque futur.

Nous estimons que le *prêt* d'une partie de la réserve à l'assuré ou le *rachat* de l'assurance par l'assuré et par remboursement de la majeure partie de la réserve deviendraient choses inintelligibles, si la chose prêtée n'était pas propriété de l'assureur, si la chose rachetée n'était pas vendue rétrocédée à l'assuré, par son propriétaire, l'assureur.

Il ne s'agit nullement de *donner* aux assurés partants, des sommes qui ne leur appartiennent pas.

Le pacte de rachat (Code Civil, art. 1659), n'a rien commun avec la donation.

En admettant même, qu'après engagement formel par l'assureur, d'adopter un certain taux d'intérêt hypothétique comme base de ses opérations, le preneur d'assurance pourrait invoquer une violation de convention, si l'assureur voulait élever ce taux, ce qui diminuerait les sûretés promises; nous demanderions dans l'hypothèse contraire, c'est à dire dans l'hypothèse où l'assureur aurait ultérieurement réduit ce taux d'intérêt hypothétique, adopté à l'époque initiale de l'assurance, si l'on admettrait un seul instant que le prétendu droit réel sur la réserve ou même l'action personnelle procédant de la convention, pourraient s'étayer sur la base plus large de la réserve constituée au taux de l'intérêt réduit.

Nous demanderions comment, dans le cas d'assurance temporaire, comment dans certaines espèces d'assurances de survie, là où il existe aussi une réserve de primes, on aurait toléré que l'assureur spoliât audacieusement l'assuré, en supprimant tout droit de rachat pour remboursement d'une portion quelconque de la réserve, si cette suppression constituait réellement une atteinte au droit de propriété.

Quant à la conception de la réserve comme propriété des assurés

grevée de certaines servitudes, elle ne peut se comprendre juridiquement (Code Civil, art. 637).

Bref, il n'existe pas deux vérités: une vérité mathématique et une vérité juridique. La vérité est une et indivisible.

Bien que conception mathématique et bien que contrat *sui generis*, l'assurance en cas de décès ne peut altérer les principes de la loi civile en fait de propriété, de gage, de dépôt ou de servitudes, et il n'y a aucune nécessité pour elle de prétendre à ces altérations ou de se trouver en état d'opposition avec ces principes. Nous estimons que l'opinion suivant laquelle la prime est *aliénée*, devient la pleine propriété de l'assureur et fait pour partie l'objet d'un pacte de rachat, est absolument correcte, ne froisse rien et respecte les principes du droit, de même que les bases mathématiques de l'assurance.

Nous invoquerons à l'appui de notre opinion, notamment:

"L'arrêté de Compte en Affaires de Banque et d'Assurances," par Wagner, p. 35.

"L'Acception juridique de la Réserve des Primes," par Diedrich Bischoff, pp. 82 et suiv. (Brème, 1890.)

"La Nature juridique de la Réserve des Primes," par Hecker, p. 55. (Stuttgart, 1890.)

"Du Rachat des Polices dans les Compagnies d'Assurances sur la Vie," par Van Schevichaven. *Annuaire Ehrenzweig*, XIe année, pp. 112, 114, 115.

Vauzanges, "Les Caisses d'Épargne et les Assurances," *Moniteur des Assurances de Paris*," t. x., p. 361.

"Le Contrat d'Assurance en cas de Décès," par Rehfous, p. 82.

"Lebensversicherung aus dem Handwörterbuch der Staatswissenschaften," par M. Emminghaus.

Pour l'opinion contraire, voir, *Journal de l'Institut des Actuaires français*, IVe année, p. 17 et 30.

Cet exposé fournit un témoignage de la multiplicité des éléments législatifs avec lesquels la législation spéciale à souhaiter pour le contrat d'assurance sur la vie, peut avoir à compter.

À ne considérer que le seul titre des conditions constitutives légales du gage en cas de prêt d'une partie de la réserve de primes, il est aisé de reconnaître l'importance majeure que comporte la proclamation de l'attribution exacte du droit de propriété sur la réserve de primes, dans tel ou tel chef.

Nous pourrions encore signaler notamment parmi les questions délicates soulevées par la nature spéciale du contrat d'assurance en cas de décès, celle qu'engendre l'antagonisme entre les droits du créancier gagiste en vertu des dispositions de droit commun sur le gage et le sentiment de moralité publique qui répugne à la mise en vente aux enchères publiques d'un contrat d'assurance de cette espèce (Voir Lefort, "Traité du Contrat d'Assurance sur la Vie," t. ii., p. 286).

Nous croyons devoir nous borner ici à la sommaire présentation des considérations qui précédent sur les nombreuses questions que soulève le contrat d'assurance sur la vie, lorsqu'on le met en présence des législations de nationalités diverses et de droit commun au point de vue international.

III. Du Traitement Législatif des Institutions d'Assurances sur la Vie, au Point de Vue International.

Au point de vue international, les conditions de traitement des organismes ou institutions, qui mettent l'assurance sur la vie en pratique, sont empreints d'une diversité qui procède, soit de la législation générale ou du droit commun, propre à chaque pays, soit d'une législation spéciale ou d'ordonnance spéciales, visant particulièrement les sociétés d'assurances sur la vie indigènes ou étrangères, ou visant particulièrement les sociétés étrangères.

Il est intéressant de mettre en lumière quelques unes des principales dispositions accusant ces diversités.

Nous nous bornerons à signaler celles qui procèdent :—

1° De certaines prescriptions, appelées à réglementer l'élaboration des bilans ;

2° De certaines prescriptions relatives au dépôt et à la composition des réserves de primes ;

3° De certaines prescriptions quant à l'étendue des pouvoirs des représentants des compagnies étrangères ;

4° De certaines prescriptions relatives à l'établissement de bilans spéciaux n'embrassant que le groupe des opérations d'une société realisées dans un certain rayon topographique.

Il est incontestable qu'au point de vue international il serait grandement désirable qu'il existât unité bien entendue et réciprocité dans le mode de traitement des institutions, qui entreprennent les opérations d'assurance.

C'est dans cet esprit et dans un ordre d'idées plus général, qu'étaient intervenues en matière de sociétés anonymes, les conventions lois belge du 14 mars 1855, et française du 30 mai–11 juin, 1857, dont le principe de réciprocité fut successivement étendu à d'autres pays.[1]

Nous disons réciprocité bien entendue, parce qu'il ne faut pas, qu'à l'aide de lois spéciales restrictives, on annule indirectement l'esprit largement libéral, que comportaient les conventions précitées.

Il ne parait cependant point, que nous marchions actuellement dans ce sens, il semble au contraire que nous nous en éloignons chaque jour davantage.

Nous sommes certes loin de méconnaître les difficultés inhérentes à la création de cette unité et les questions délicates qu'elle soulève, mais nous croyons regrettable de constater, qu'on les multiplie, au lieu de chercher à prévoir, à préparer leur aplanissement.

Aujourd'hui, loin de procéder dans l'esprit libéral dont s'etaient inspirées les anciennes conventions, lois, que nous avons citées, il semble que le but proposé est de les éluder indirectement, par toute espèce d'entraves, de mesures coërcitives, sans souci du respect de *l'indivisibilité* de l'être moral—la société qui traite l'assurance ; sans souci de la liberté que doit conserver son administration ; sans souci, comme sans responsabilité, du chef des mesures, souvent malentendues, qu'on impose d'autorité.

Nous pensons en effet, qu'une société d'assurance, être moral,

[1] C'est dans le même esprit qu'a encore été redigé l'art. 128 du Code de Commerce Belge.

puisant son existence dans une fiction de la loi, dans son pays d'origine, est un être *un* et *indivisible*.

Nous croyons pouvoir donner à cette pensée le caractère élevé d'un principe, et nous estimons que ce principe ne subit point et ne doit point subir d'altération par le fait de l'extension de l'activité de cet être moral, hors de son pays d'origine, dans des pays de nationalités diverses.

Même dans ce cas, cet être moral doit demeurer un et indivisible.

Or, au cours de ces dernières années, il a été édicté de diverses parts des mesures dont le caractère se concilie mal ou ne se concilie point avec le parfait respect de cette unité.

Parmi les prescriptions de l'espèce, nous croyons pouvoir ranger les prescriptions réglementaires concernant les conditions dans lesquelles doivent être dressées les bilans.

Et parmi celles-ci, nous signalerons les mesures édictées par l'article 261 du Code de Commerce Allemand remplaçant les art. 185*a*–239*b* de la loi du 18 juillet 1884.[1] Cet article est ainsi conçu :

" Art. 251.—Für die Anstellung der Bilanz, kommen die vorschriften " des artikels 40 mit folgenden Massgaben zu Anwendung :

" 1. Werthpapiere und Waaren, welche einen Börsen oder Markt- " preis haben dürfen höchstens zu dem Börsen oder Marktpreisen zur " Zeit pünktes für welchen die Bilanz aufgestellt wird sofern dieser " Preis jedoch den Anschaffungs oder Herstellungspreis übersteigt, " höchstens zu dem letzeren angesetzt werden.

" § 1. Les titres mobiliers et marchandises qui possèdent une valeur " de Bourse ou de mercuriale peuvent être portés au plus au cours de " la Bourse ou du marché pour la période embrassée lors de l'établisse- " ment du Bilan, pour autant cependant que ce cours, ne dépasse pas le " prix d'acquisition ou de production, ils ne peuvent être portés au " dessus de ce dernier."

Ce paragraphe reproduisait à peu de choses près, la disposition de l'article 239*b* de l'ancienne loi de 1884.

Il est à peine nécessaire de signaler, les étranges conséquences auxquelles peut conduire cette législation en certaines circonstances et malgré ses bonnes intentions.

Elle peut en effet, mettre à un moment donné une société d'assurances sur la vie, dans l'onéreuse et déplorable nécessité de réaliser d'excellentes valeurs présentant une plus value, valeurs de tout repos qu'elle doit désirer conserver, afin de maintenir certain taux d'intérêt minimum dans son portefeuille, et cela pour amortir une moins value factice, passagère, à peine de devoir accuser sur l'ensemble de sa situation, une perte en évidente contradiction, avec le bénéfice non réalisé, traduit par la plus value qu'elle pouvait cueillir, sur d'autres valeurs de son portefeuille mais que la prudence lui commande de tenir intacte.

Si l'on réfléchit aux conséquences de ce régime, pour une institution qui recherche et doit rechercher les placements de tout repos, avec le desir de les conserver, on en arrive à reconnaître, que si les valeurs de portefeuille étaient *successivement* atteintes par une dépréciation passagère, non consommée par des ventes, l'institution arriverait à devoir accuser, par le cours des valeurs conservées, un déficit con-

[1] Et qui se trouve en concordance avec les ordonnances spéciales du ministère de l'Intérieur des 2 février 1891 et 8 mars 1892.

sidérable, capable de mettre le maintien de son existence en question (art. 72 du Code de Commerce Belge) alors que suivant les cours de la bourse, son portefeuille accuserait cependant une importante plus value.

Une circulaire de la Présidence de la Police de Berlin en date du 18 mai 1895, n'a apporté qu'un léger tempérament à ces prescriptions, en permettant aux sociétés d'assurances de *reporter* à l'actif à leur prix moyen d'achat antérieur en cas de hausse, les valeurs qui auraient dû être portées au dessous de ce prix par suite de baisse momentanée au 31 décembre de l'exercice précédent.

D'autre part en Autriche, il existe une Ordonnance Ministérielle du 18 août 1880, concernant la concession et la surveillance des institutions d'assurance par l'État (*Reichsgesetzblatt*, Jahrgang 1880, XXXVIII. Stück, No. 110, page 398 et s. Verordnung der Ministerien des Innern, der Justiz, des Handels und der Finanzen vom 18. August, 1880, womit Bestimmungen für die Concessionirung und Staatliche Beaufsichtigung von Versicherungsanstalten kundgemacht werden), suivie d'une seconde ordonnance du 5 mars 1896 : *Reichsgesetzblatt*, Jahrgang 1896, XIII. Stück, No. 31, betreffend die Errichtung, die Einrichtung und die Geschäftsgebarung von Versicherungsanstalten.

Des sections différentes, de cette dernière ordonnance, traitent ce qui concerne :

A. La création des institutions d'assurance ;

B. L'organisation des institutions d'assurance ;

C. L'administration financière (placements, Geschaftsgebarung) des institutions d'assurance (réserve de prime, placements de capitaux, comptes, rapports).

D. Les dispositions générales ;

E. Les petites associations mutuelles d'assurance.

À la suite des 53 articles de la dernière ordonnance, figurent les formulaires prescrits pour la présentation des comptes des institutions d'assurances sur la vie (pures et mixtes) et à la section concernant le Bilan—actif—article 5, on trouve, à l'encontre de la disposition du Code de Commerce Allemand, une prescription décidant, qu'il faut porter les Werthpapiere zum Curswerth am Schlüsse des Rechnungsjahres (detaillirt mit besonderer Ausweisung der laufenden Zinsen) les titres de portefeuille à leur valeur au cours, à l'expiration de l'exercice (détaillés avec indication spéciale des intérêts courants).

De la sorte, une société peut avoir intérêt à pousser à la hausse des cours au 31 décembre d'un exercice ou elle peut se trouver subir l'effet d'une baisse momentanée à un jour donné, artificielle ou non.

En outre, les institutions d'assurances ont à produire une trentaine de tableaux statistiques, comportant de minutieux détails de tous genres.

En France, en Belgique il n'existe pas de prescriptions étroites et spéciales au sujet de l'estimation des valeurs au bilan. La publicité donnée à la composition du portefeuille et au cours auquel les valeurs sont portées au bilan, permet aisément au public, de contrôler la prudence des évaluations du portefeuille, en les rapprochant des cotes de bourse du 31 décembre.

Ce contrôle est, à notre sens, beaucoup plus efficace que toutes les mesures impératives ; il est à la portée de tout le monde et peut s'exercer par tout le monde.

Nous passons à l'exposé de quelques mesures spéciales imposées, soit aux sociétés d'assurances sur la vie en général, indigènes ou étrangères, soit spécialement aux sociétés étrangères d'assurances sur la vie.

Depuis le 1 janvier 1883 le Code de Commerce en vigueur en Italie, a introduit par son article 145, une disposition en vertu de laquelle:

"Les compagnies d'assurance sur la vie, ainsi que les sociétés " tontinières tant nationales qu'étrangères, devront déposer en titres de " la dette publique à la Caisse des dépôts et consignations, dans la " proportion *d'un quart pour les premières, de moitié pour les secondes*, le " montant des primes qu'elles auront encaissées et des intérêts produits " par le placement des dites primes.

" La forme de ce placement et les conditions du retrait des sommes " ainsi déposées seront l'objet d'un décret royal."

145. Le società di assicurazioni sulla vita a le società amministratici di tontine nazionali od estere, devono impiegare in titoli del debito publico dello Stato, vincolati presso la cassa dei depositi e prestiti, un quarto se sono nazionali, o la *metà se sono estere*, delle somme pagate per le assicurazioni e dei frutti ottenuti dai titoli medesimi.

I modi ed i termini di questo impiego e dei graduali svincolamenti sono stabiliti con regio decreto.

On trouve en effet les indications annoncées en cet article, dans les articles 55 et suivants du décret du 27 décembre 1882, No. 1139, Série 3ª, appelé à réglementer l'exécution du Code de Commerce Italien.

La Prusse, par une ordonnance du Ministère de l'Intérieur en date du 8 septembre 1891, a exigé que:

". . . les Compagnies étrangères d'assurances sur la vie autorisées " à opérer en Prusse, mais non allemandes, soient obligées d'employer en " dette consolidée prussienne inscrite, au Grand Livre, la moitié de la " recette de primes annuelles—en ajoutant que ces Compagnies ne " pourraient plus disposer de la somme ainsi inscrite, sans l'agrément " du Ministre de l'Intérieur."

Une autre ordonnance du 23 mars 1892, étendit la faculté d'emploi des fonds de garantie en dette allemande.

Enfin, une dernière ordonnance du 13 mai 1892, décida, que cet emploi aurait à se poursuivre jusqu'à ce qu'il atteignit la moitié de la reserve de primes afférente aux affaires prussiennes.

Le Grand Duché de Luxembourg a poussé les choses plus loin, un Arrêté Grand Ducal du 20 septembre 1891, portant réglement pour l'exécution de la loi du 16 mai 1891, sur la surveillance des opérations d'assurance, a disposé (art. 3):

" Les assureurs opérant sur la vie de l'homme, fourniront à titre de " cautionnement, une somme fixe qui ne peut être inférieure à " 50,000 frs. et une somme variable égale au *double* du montant des " primes de l'exercice révolu."

La loi du 16 mai 1891, admettait que le cautionnement fut fourni en obligations de l'emprunt Luxembourgeois ou en d'autres fonds, dont les titres sont au porteur.

Le projet de loi sur les sociétés d'assurances de 1895 pour la Norwège, après avoir déterminé limitativement (art. 49) les placements admis pour emploi de la réserve de primes, en réservant une exception

au point de vue du dépôt et de l'emploi de la réserve dans les pays étrangers, prescrit en son art. 109 le dépôt :

(*a*) De la réserve de primes pour les assurés en Norwège, déduction faite de la réserve de primes pour la portion des risques cédés en réassurance, à des sociétés norwégiennes ;

(*b*) La moitié de la recette des primes brutes de l'année précédente, pour les mêmes assurances et avec la même déduction.

(*c*) Un complément de sécurité à ajouter à la réserve de primes déposée, calculé suivant le procédé de l'art. 50, mais non inférieur à 100,000 kronen.

Suivant cet article 50, la partie versée du capital action ou de garantie y compris le fonds de réserve ne peut être inférieure à 5 % de la réserve de primes. Et au cas où la société traite les risques en cas de décès, elle est encore tenue de constituer un autre fonds de réserve de 1 % au moins des capitaux assurés, à son compte, pour cette catégorie. Ces sommes sont qualifiées fonds de sûreté de la réserve de primes.

Le projet de loi hollandais sur les assurances sur la vie, élaboré par un comité nommé par décret du 10 janvier 1897, et qui a produit un rapport remis à la reine régente le 27 fevrier 1897, indépendamment de prescriptions des plus draconiennes envers les compagnies étrangères et indigènes, propose aussi (art. 74 du projet) d'imposer aux premières l'emploi des réserves en immeubles ou valeurs hollandaises à déposer à la Banque Hollandaise, en les affectant par privilège, à la garantie des engagements du chef de risques en cours en Hollande.

Le même projet a cru devoir proposer des mesures préventives spéciales à l'égard des représentants des sociétés étrangères en Hollande. Son article 7 dispose que " une société étrangère doit prouver qu'elle a " nommé un représentant qui devra être pourvu des mêmes pouvoirs que " le Directeur de la compagnie : il doit être autorisé à réaliser des assur- " ances ou à représenter la compagnie devant la justice."

Cette prescription a un caractère d'excessive gravité.

En effet les administrateurs et directeurs d'une compagnie sont généralement nommés par les actionnaires, ils exercent en vertu des statuts et sous certaines garanties un mandat *sans* pouvoir de *substitution* ; or le projet hollandais, en exigeant que le représentant de la société étrangère soit autorisé à *réaliser* des assurances, entend investir ce représentant du droit de conclure à lui seul des assurances, droit qu'il ne peut posséder qu'en vertu d'une substitution qui serait généralement en opposition avec les usages statutaires de beaucoup de sociétés qui exigent l'intervention d'un Directeur spécial ou d'un administrateur dans la conclusion des assurances, dans la conclusion de chaque engagement social.

On comprendrait à la rigueur, que le législateur hollandais exigeat la signature du représentant en Hollande au bas de l'engagement de la société étrangère pour certifier ou renforcer la signature des représentants de l'administration centrale ; mais on ne peut admettre qu'il entende imposer à une société l'obligation de se trouver liée par l'engagement que le représentant indigène pourrait prendre irrégulièrement et même à l'insu de sa société.

Il y aurait dans un mandat obligatoire aussi absolu quelque chose de

peu compatible ou même d'incompatible avec l'assiette normale de la responsabilité administrative d'une société.

L'obligation de constituer la réserve uniquement, *exclusivement* en fonds d'État et de la déposer dans la Caisse de l'État ou dans une caisse désignée par l'État, est une mesure regrettable et mal entendue, attendu qu'en cas de baisse atteignant les fonds d'un État, la valeur de la réserve de primes pour les assurances conclues sur le territoire de cet État, peut se trouver sensiblement altérée toute entière à un moment donné (le cas s'est produit pour la dette italienne). Attendu que le dépôt des fonds d'État dans la Caisse de l'État et les entraves ou les impossibilités qui grèvent leur disposition, enlèvent aux compagnies d'assurances tout moyen de prévenir, d'esquiver, le préjudice d'une dépréciation prévue ou d'une conversion prochaine.

Attendu qu'en somme l'obligation imposée à une compagnie d'assurance d'avoir à employer son fonds de réserve de primes exclusivement en valeurs de l'État, constitue un véritable acte d'ingérence administrative de l'État, avec la prétention d'en décliner la responsabilité.

Attendu enfin, que si l'emploi en fonds d'État devient trop coûteux, il peut ne plus répondre à l'hypothèse d'intérêt adoptée par l'assureur, comme base de ses opérations embrassant la vie humaine et le forcer à augmenter ses tarifs au préjudice du public assurable sans sérieuse compensation pour ce public.

Le dépôt des réserves ou de partie des réserves a d'autres inconvénients graves particuliers déjà signalés par Mr. Harding à juste titre, nous nous bornons à les rappeler.

Arrivons aux bilans spéciaux.

Parmi toutes les mesures qui doivent provoquer l'attention au point de vue international en matière de législation intéressant les sociétés d'assurances sur la vie, il n'en est guère de plus importante que celle des *Bilans spéciaux* régionaux.

Il arrive que soit en vertu de loi, soit en vertu d'ordonnances administratives, tel État impose dans un but fiscal ou autre à ces sociétés, l'obligation de dresser un bilan particulier de leurs opérations réalisées dans cet État, afin d'asseoir par exemple l'impôt sur le bénéfice provenant de cette circonscription topographique et détachées de l'ensemble de ses opérations.

Or, la mortalité générale pour les assurés d'une société peut se dérouler conformément à l'hypothèse de la table de mortalité adoptée comme base de ses opérations, elle peut lui être inférieure, elle peut lui être supérieure.

Si elle lui est inférieure la marche de la mortalité se fera sentir favorablement dans les résultats du bilan.

Si elle lui est supérieure, la marche de la mortalité se fera défavorablement sentir dans ces mêmes résultats.

Ces effets s'accuseront aussi plus ou moins sensiblement dans l'un ou l'autre sens, suivant que les hasards de la mortalité auront amené sur le terrain financier, en tenant compte des moyennes, le paiement d'un capital total supérieur ou inférieur à la moyenne générale des capitaux assurés par tête.

Nous estimons que ces résultats généraux, ne peuvent être rationnellement scindés.

Pour en fournir la démonstration, supposons qu'une société d'assurance ait l'ensemble de ses affaires représenté par un groupe de 8,987

têtes, toutes âgées de 30 ans (nombre des vivants à cet âge table H^m) la mortalité la plus probable, dans ce groupe durant l'année, est de 69 têtes, suivant cette table.

Supposons maintenant que ce groupe de 8,987 têtes se décompose en 4,000 têtes indigènes et 4,987 têtes étrangères, et que la mortalité réelle ait été de 50 têtes dans la section indigène et de 20 têtes dans la section étrangère ;

La mortalité la plus probable dans le groupe indigène deviendra :

$$8987 : 69 :: 4000 : x.$$

$$\frac{69 \times 4000}{8987} = x.$$

$x = 30{\cdot}71.$

La mortalité indigène aura donc été défavorable comme 50 : 30·71.

La mortalité, la plus probable, dans le groupe étranger deviendra :

$$8987 : 69 :: 4987 : x.$$

$$\frac{4987 \times 69}{8987} = x.$$

$x = 38{\cdot}29.$

La mortalité étrangère aura donc été favorable comme 20 : 38·29.

Le rapport entre la mortalité réelle du groupe général 70 et la mortalité la plus probable 69 pour le même groupe, ne se trouve donc proportionnellement refleté, ni dans l'une, ni dans l'autre section.

La mortalité dans le groupe d'affaires indigènes ayant été défavorable, le bilan des affaires indigènes s'en ressentira défavorablement, pourra même présenter une perte, alors que le mouvement général des affaires de l'assureur présenterait cependant un bénéfice.

La division du groupe général peut décéler la même surprise au point de vue des rapports proportionnels entre la moyenne des capitaux probablement payables et celle des capitaux réellement payés.

L'exigence des bilans spéciaux est donc irrationnelle, mal fondée, elle ne peut mener qu'à des conclusions aussi bizarres qu'erronées.

Nous disons bizarres, car on remarquera que dans nos considérations, nous avons négligé tout ce qui concernerait une ventilation arbitraire du capital social, de la réserve statutaire, des frais généraux, etc. . . .

Les principes en matière de réciprocité internationale, subissent forcément l'influence de chaque législation indigène et la tendance quant à la mise en pratique de ces principes devrait en équité viser à la tolérance de chaque régime étranger, en tant qu'il ne crée point une situation privilégiée pour la société étrangère vis à vis de la société indigène.

Il faudrait surtout d'abord repousser cet esprit d'hostilité latente envers les institutions d'assurances et qui se traduit par leur véritable mise sous une *curatelle irresponsable*.

Si l'on observe le courant actuel des choses, il semble que l'esprit appelé à les régir ait tendance à s'inspirer de la vieille langue latine qui employait le même mot (hostis) pour désigner l'étranger et l'ennemi.

> " *Deux sûretés valent mieux qu'une,*
> " *Et le trop en cela ne fut jamais perdu.*"

Cette morale de la fable semble avoir exclusivement hanté l'esprit des lois, décrets, ordonnances ou réglements projetés ou arrêtés, appelés

à régir les entreprises d'assurances et spécialement les sociétés d'assurances étrangères, vis à vis desquelles certaines réglementations prennent même le caractère d'une véritable loi des suspects les soumettant à une sorte de garottage.

Sans rechercher la valeur des motifs spéciaux qui ont pu concourir à l'adoption de ce caractère, il semble impossible de ne pas se demander si ce cortège de mesures préventives ne présente pas de fort mauvais côtés.

Il faut en effet reconnaître notamment, que l'obligation de convertir la réserve de primes en fonds d'État, que l'obligation de fournir des garanties supplémentaires, doivent puiser leurs moyens d'exécution quelque part et que la charge de ces moyens d'exécution doit, en dernière analyse sous forme d'aggravation du prix de l'assurance, retomber à charge du public assuré.

Or, il est bien certain que plus le prix de l'assurance s'élève, plus on entrave l'esprit de prévoyance, plus on enraye l'essor de l'institution, moins l'institution devient accessible à la masse et alors que le fait économique de la réduction du taux d'intérêt des placements de tout repos, tend à lui seul à entraîner un renchérissement du prix de l'assurance, on peut se demander, si la multiplicité des mesures de garantie en sus des garanties normales exigées par la téchnique des assurances et entourée d'une bonne publicité, est chose vraiment bien entendue, vraiment bien opportune.

Si l'on envisage ces procédés coërcitifs au point de vue spécial des compagnies étrangères et des principes de réciprocité, il est à croire qu'au lieu d'entrevoir une ère de réciprocité bienveillante, on ne marche à un régime de réciprocité du type de celui adopté dans l'État d'Illinois et que nous qualifierions volontiers de *type talion*.

216. *Réciprocité.* § 19. — " Lorsque les lois actuelles ou " futures de tout autre État des " États Unis exigeront, soit des " compagnies d'assurances, contre " les accidents constituées ou or- " ganisées conformément aux lois " de l'État d'Illinois et possédant " des agences dans cet autre État; " soit des agents de ces compag- " nies un dépôt dans cet État de " valeurs destinées à garantir les " porteurs de police ou dans tout " autre but ou le paiement de " taxes, amendes, droits, certificats " d'autorisation, patentes ou autres " charges plus lourdes que celle " exigée aux mêmes fins dans " l'État d'Illinois à charge des " compagnies d'autres états, dans " ce cas et dans chaque cas sem- " blable, toutes les compagnies " d'assurances contre les accidents " de ces Etats qui établiraient ou

216. *Reciprocity.* § 19. — Whenever the existing or future laws of any other State of the United States shall require of accident life insurance companies, incorporated by, or organised under the laws of this State, and having agencies in such other State, or of the agents thereof, any deposit of securities in such State for the protection of policy-holders or otherwise, or any payment of taxes, fines, penalties, certificate of authority, license fee, or otherwise, greater than the amount required for such purposes from similar companies of other States by the then existing laws of this State, then, and in every such case, all accident life insurance companies of such States establishing, or having heretofore established an agency or agencies in this State, shall be and are hereby required

French.	*English.*
" qui auraient déjà établi une " agence ou des agences dans " l'État d'Illinois, sont et seront " par la présente loi, obligées " d'opérer chez le Trésorier de " l'État d'Illinois, pareil dépôt " dans le même but et de payer " à l'Auditor pour taxe, amende " droit, patentes, certificats d'auto- " risation ou autres obligations, " une somme égale à celle que les " lois des autres États imposent " aux compagnies Illinoises ou à " leurs agents."	to make the same deposit for a like purpose with the State Treasurer of this State, and to pay to the Auditor for taxes, fines, penalties, certificates of authority, license fees or any other obligation, an amount equal to the amount of such charges and payments imposed by the laws of such other States upon the companies of this State and the agents thereof.[1]

Nous ne croyons pas que la pratique de l'assurance puisse gagner à la réciprocité de ces procédés de coërcition, si légitimes que puissent être des mesures qui prennent le caractère de véritables représailles.

Si tant est que l'entreprise des assurances sur la vie puisse donner lieu à des abus, plus que beaucoup d'autres institutions, telles que les banques, les compagnies d'assurances contre l'incendie et contre les risques de transport, les sociétés de navigation et d'expédition comme le relève justement M. T. van Schevichaven (voir son Étude sur le projet de loi hollandais, *Revue Baumgärtner*, t. i., p. 600). Nous pensons que c'est au moment de la constitution de l'entreprise que le législateur doit avoir l'œil ouvert, que c'est à ce moment qu'il peut utilement imposer des mesures préventives, en exigeant les preuves justificatives des éléments techniques et financiers appelés à constituer les bases solides de celle-ci.

Si la réglementation a de bons côtés quand elle est prudente et bien pondérée, il ne faut pas oublier qu'elle peut en avoir de fort mauvais, quand elle est vexatoire, vétilleuse, paralysante, outrancière; le principe de cette réglementation tient à certains égards de la nature de la langue qu'Esope accomodait tour à tour pour Xantus, comme la meilleure ou comme la pire des choses.

[1] List of Acts passed by the General Assembly of Illinois, 1889, p.

Translation.

I.—*On Legislation of various kinds relating to the Life Assurance Contract, from the International point of view.* *By* Henri Adan.

I.

The eighth question appearing in the programme of the first Actuarial Congress, held at Brussels, ran as follows:

"Study of the legal provisions in force or in contemplation in "various countries relating to life assurance companies, more "particularly in the matter of deposits demanded by the Governments, "and in that of taxes charged on the premiums."

Several Papers, notably that of our honoured colleague Mr. Harding, dealt with the question thus brought forward.

To-day that question appears in the programme of the London Congress with a wider scope, namely: (First) The relations of legislation, whether civil or commercial, to the life assurance contract entered into by an assurance institution of one nationality, within the domain, and with the assured of another nationality. (Second) Legislative measures applied to assurance institutions of a particular nationality extending their operations beyond their native territory.

We are glad, however, to recall here the previous works which we have already mentioned, to render them the honour which is their due, and to call attention to the contribution they have already made to the discussion of the question.

I should refrain from raising the large subjects included in this question, as it exists to-day, if it seemed to me impossible to bring it within the limits of a Paper which must not exceed moderate dimensions. The historical aspect of the question would alone involve a lengthy examination. I have, therefore, to beg the greatest indulgence for the insufficiency of my work, and the important omissions which will be noticed, because of the wide scope of the questions to be discussed, and the method of treatment which that necessitates.

II.

From the point of view of legislation governing the contract of life assurance, one notices remarkable differences in different countries. In certain countries (in Germany and in Switzerland, for instance), there have been met with for a long time, in the Civil Code, regulations governing this contract, more or less perfect, more or less complete. In other countries (Belgium, Hungary, Holland, Italy), special laws have been enacted intended to affirm the legality of the contract, and to regulate

it with a view of taking account of its special character. In other countries (Germany and Switzerland), preparations are on foot to prepare new legislation. Finally, in others (in France), it seems that they deem it desirable still to temporize and to leave the fate of the contract to the uncertainty of a jurisprudence which, doubtless, they do not look upon as being sufficiently settled. We therefore think that it can be said, in a general way, with Ehrenberg, (vol. I, *Das Versicherungsrecht*, p. 41). "While the science of assurance has "arrived at technical perfection, a practical development unequalled, "the law which is required to give it foundation and solidity remains "in a regrettable condition of inferiority, of intrinsic and extrinsic "insufficiency." Counsellor von Knebel Doberitz expressed himself in much the same sense at Berlin, on the 29 March 1897, when initiating the Prussian Technical Commission of Assurances, established by Ministerial decree of 13 October 1896.

The development of the law in the matter of life assurance is, in fact, far from having advanced at the same rate as the mathematical science which gave birth to this admirable and ingenious institution. It is not without interest, from the point of view of the indigenous varieties of legislation and of their international effects, to try to take account of the effective causes of the generally tardy pace of the legislative movement, and, as it is in France that we find an absolutely virgin situation in the matter of legislation specially regulating the contract, it may be inferred that there we could perhaps gather useful indications, fitted to bring into clear light the influences of the causes which delay or confuse the initiative of the legislator in the presence of a contract, which in practice has nevertheless become universal. In the brilliant conference upon the subject of the formation of chalk deposits, held at the Norwich meeting of the British Association for the advancement of science, Huxley showed that the earth had been for many ages the scene of a series of changes as gradual as they had been considerable. The views put forward by the illustrious savant on the subject of the transformations of the terrestrial globe can be applied to the world of political economy, to the world of legislation. This idea is confirmed when one glances at the parallel histories of law and of political economy, when one considers the slow but continuous changes in the former under the transforming influences, persistent, sometimes indirect and sometimes concealed, of the latter. If Rossi thought that he could write, in 1857, that at the promulgation of the French Civil Code (1803-1804) the social revolution had been accomplished by the abolition of privilege, he added that the economical revolution was far from having completed its course, and, summarizing his conclusions, he said, "Our codes, through the natural course of "events, have found themselves placed between two mighty forces of "which one has preceded them and the other has followed them, the "social revolution and the economic revolution. They were able to "guide the former, they have not been able to guide the latter. There "is, therefore, without blame being attributable to anyone, a gap to "be filled up, a harmony to be re-established between our law as it "relates to individuals and our economic state." This harmony must be found in the union, in the combined action of political economy and law. Now, among all the economic innovations which came after the promulgation of the French Civil Code, there are not many which

have involved so much as the contract of life assurance, a conception of an original character of which the versatile nature distinguishes it so much from the convention issuing from the Roman law or ordinary law, and subsequently regulated by the Code. We have already said that the idea involved in the contract of assurance against death was not less troublesome, in the classifications of the Civil Code, than the ornythorinchus in the classification of Cuvier. Also the harmony to be established between the civil law and such law as will take account of the special nature and the necessities of life assurance, remains absent or insufficient, according to the facilities or the difficulties, more or less great, in the reconciliation of the local civil law with the special nature of this assurance, according to the knowledge, more or less thorough, of the matter by the legislators. It is, therefore, not to be wondered at that Rossi, passing in review the defects of the French Civil Code, and recognizing that these were to be found more particularly in its quasi-material portions, in those which treat of property independent of the condition of people, should have pointed out that the compiler of the Code had found himself out of his depth when he came into contact with the principles of economic sciences, and especially when he occupied himself with the ways in which property is safeguarded. It is this that led him to say, "Among " industrial institutions, there are none more useful than those which " have for object assurance. Assurance robs misfortune of its most " baneful power in spreading its effects. Co-operation ennobles itself, " assumes to a certain extent the form of benevolence. By the means " of assurance, the most hazardous enterprizes retain but little of their " dangers: the most terrible misfortunes lose their terrors. More " than one father on his death-bed has owed to life assurance the " ineffable happiness of being able to turn his last glances without " anguish on his wife and his children.

" Nevertheless, with the exception of marine assurance, we do not " find in our codes one single reference to this matter so important. " It is, in part, to the silence of the law that one must attribute the " indifference of the public towards an institution so useful, so " righteous, as life assurance. Selfishness and ignorance find a kind " of justification in the silence of the legislator. They neglect what " the legislator appears to have despised."

We have thought it useful to quote these declarations of Rossi, because we think that they explain sufficiently accurately the origin of the hesitation that we still see existing in France, notwithstanding the brilliant efforts which have already been made to put an end to a condition of things so lamentable.

Two recent events seem to us to indicate a continuance of these delays. One is to be found in an article by M. Paul Bailly (*Moniteur des Assurances de Paris*, 15 October 1897), examining the important provisions of the new Civil Code of Germany, bearing upon life assurance, and the provisions as to the benefit of third parties, which run thus:

" Article 330—If in a contract of life assurance, or for a life " annuity, the payment of the sum assured or of the annuity to a third " party has been stipulated for, should any doubt arise, the third " party immediately acquires the right to demand payment. It is the " same when in a voluntary settlement they impose on the immediate

" beneficiary a payment to be made to a third party, or when in a " settlement of real or of personal property the settlor, with the " object of freeing himself, promises a payment to a third party.

" Article 331—If the payment in favour of a third party is to " take place after the death of the settlor, in case of doubt, the third " party acquires a right to the payment at the death of the settlor.

" If the settlor die before the birth of the third party, the " promise to make the payment to the third party can no longer be " modified or cancelled, unless the power of doing so has been " reserved."

Now, we know that the controversies on the question of dispositions in favour of others can be summarized under two heads, the one assuming that the disposition in favour of others is an offer by the settlor under which the beneficiary only acquires his rights by his acceptance of them; the other admitting that the beneficiary, although he is a stranger to the contract, acquires his rights which come into existence for his benefit from the settlement made, unknown to him, and without his being a party to it.

M. Bailly has very happily collated the two theories and brought together the arguments in favour of and against each, even those which some people draw from the rational principles of the Roman law against the one-sided arrangement admitted by the German Legislature in the same way as in the matter of a security to order or a security to bearer.

The second point is to be found in a recent discussion on the relations between law and political economy, which took place at the Society of Political Economy of Paris, and in the course of which there was produced a mass of antiquated arguments to be opposed to an authority of the weight of M. Lyon Caen, when he pointed out that the French jurisprudence, enlightened and inspired by political economy, proclaimed that the capital conferred on the beneficiary by the assured does not form part of the estate of the assured.

In Belgium, the law of 11 June 1874 was unfortunately drafted by a commission composed of men, no doubt highly distinguished, but amongst whom was no assurer, no man with technical qualifications in the special branch of life assurance. Also, a perusal of the proceedings of the commission, and of the Parliamentary debates which preceded the passing of the law, brings to light often the slow pace, and the misunderstandings, of judicial science when it touches upon these assurances. We shall only point out here that the language of the law for this description of assurance is frequently erroneous from the point of view of the definition of the parties to the contract (Article 1), that its drafting is insufficient or vague in so far as it concerns the conditions of surrender or cancelment (Article 10), that it is very obscure in the matter of conditions (Article 23), but that it has a really progressive character for which we must express satisfaction (Article 45), in following the example of Article 1757 of the Zurich law and of the Married Women's Property Act (1870), declaring that the settled sum payable at the death of the assured belongs to the person named in the contract. It is only to be regretted, in our opinion, that the same article should have subordinated the full disposal of the capital to the rules of the civil law relating to the question of account and of reduction (Articles 920 to 1,468s of the Civil Code).

We think it would have been well to have placed a limit to the application of these rules—rules which might lead to the complete reversal of the intentions of the settlor—in restricting them to the case where the premiums had not been paid entirely from the income of the assured. It seems clear to us that, within these limits, the deduction of the premiums merits well the consideration which is necessarily accorded to unproductive spending of income, or to its scandalous dissipation; and such an arrangement would really not be more difficult than the valuation which the tribunal must undertake in the case of Article 208 of the Civil Code, when it is called upon to fix the proportion of an alimony according to the fortune of him who owes it. On the other hand, it is unfortunate that the Belgian law, as set forth in this article, should not have declared, following the example of the above-mentioned English law, that if it is proved that the policy had been taken out with the intention of defrauding creditors, these would have the right to deduct from the capital assured a sum equal to the amount of premiums paid.

Lastly, high above all these defects, there is one, more general, more serious, which it seems to us can be alleged against all the laws and all the projects of law hitherto brought forward. It is that there has not been reserved for this contract a separate place or a special chapter treating fully and exclusively of this assurance of which the character is so delicate, instead of confining it within a section of more or less moderate dimensions, and of attempting to submit it to the general arrangements of contracts of assurance of much more simple risks, from which its very exceptional nature often sharply distinguishes it. This view will no doubt seem to be far-fetched in the eyes of many jurists, but we have full confidence in the soundness of our case when we see the Legislature occupied in regulating with so much care the passing of the fortune of those who have one, while we claim the same care for life assurance, the fortune of those who have none other (Reboul).

It is sufficient to recollect the difficulties which occurred in Holland with respect to the reform required to declare the legality of whole life assurance before it resulted in the revision of Article 302 of the Commercial Code, which also furnished irrefutable evidence of the hesitation, the groping in the dark, of the legislator.

In Switzerland more recently, in 1893, it being recognized with reason that the provisions of the Civil Code of Zurich did not sufficiently provide for the requirements of the contract of life assurance, the Federal Government named a special commission for the purpose of preparing a draft Federal law, not only as regards this contract, but as regards the contract of assurance in general.

We submit that every law which is well drafted must contain an exact definition of its object, because we think that this definition must pass from the technical to the juridical domain. We should, therefore, have liked to have seen introduced into the law an exact definition of assurance against death, and we think that it would have been desirable to give not only a definition of the contract, and of the premium reserve, but to declare in the law the legal title under which this reserve finds itself in the hands of the assurer. The considerations set forth in the report of M. Roelli in relation to Art. 81 of the draft Bill did not deal with this point, which, nevertheless, seems to us one

of great importance. Article 81 of the draft federal law, on the contract of assurance prepared by the commission nominated in 1893 by the Swiss Government, lays down, in effect, that "the reduced " assurance or the surrender-value of the assurance are to be fixed " according to the reserve existing at the moment when the request " for a reduced sum assured or surrender reaches the assurer. By " the reserve, as mentioned in the present law, is understood the sum " which the grantor of a life assurance, according to the actuarial " data and leaving out of account the future premiums, must have *at " his disposal* to meet his probable obligations."

We consider that, in view of the denial of its necessity in certain quarters, and of the controversies raised in other quarters as to the nature of the title to ownership, it is desirable that the title to ownership of the funds representing the premium reserve should be distinctly set forth in the law. We attach to the declaration of this title a greater importance, in view of the conditions under which the premium reserves are dealt with, on account of the more or less direct effect of the general law, civil, commercial or fiscal, of each nation. It is certainly not here that it is necessary to explain how assurers have employed a sort of levelling process in introducing a system of uniform premiums, in virtue of which the assured only pays an invariable premium during his whole life; but as this system could not escape from the inexorable laws of nature, as it had to take account of necessities arising from the future and progressive increase of the risk of death, the uniform premium, higher at the commencement than the annual cost of assurance, becomes later on lower than that cost. From this it results that the solvency of the assurer must be preserved by placing in reserve the proportion of premium in excess of the yearly cost of the risk during the first years of assurance, in order to compensate later on for the insufficiency experienced in the difference between the constant and invariable annual premium and the premium naturally increasing from year to year according to the increase in the age. The accumulation of the premium reserve fund in life assurance is not derived from other sources, has no other cause, and has no other purpose. It is, therefore, through making a larger sacrifice than necessary at the beginning, through incurring a real forfeit, that the assured obtains permanently a constantly uniform rate of premium, no matter to what extent his life may be prolonged. It is, on the other hand, in view of the same contingency that the assurer undertakes at his own risk to invest, and to render productive the excess of premiums during the earlier years, to make up for their deficiency in the later years. From these considerations it seems to us quite clear that the proposition can be laid down that *the reserve of premiums is the property of the assurer*. Nevertheless, it has been affirmed that the reserve of premiums is the property of the assured, and should be considered to be the property of the *assured collectively* subject to certain conditions. This, in our opinion, is an absolute error, unless in the case of mutual societies, in which the assured are at the same time the assurers; in which case, the entity which is produced by the collective association is the owner in the capacity of assurer, and not in that of assured.

It has otherwise been suggested that the reserve would not be, properly speaking, the property of the assured, except in throwing

back the ownership of this property on the assurer. To this we object that there are not two kinds of ownership, one which would be real, properly speaking, and another which would not be so. We add, that on this question we must submit to the principles of the law authoritatively laid down by Article 544 of the Civil Code, and that hence if the reserve is not the absolute property of the assured, it is not his property in any sense at all, and that, if we refuse to admit it to be the property of the assurer, it becomes an ownerless property, a property without claimant, which falls into the public coffers (Art. 539).

It must be distinctly understood, however, that we do not for a moment contest the imperative rigour of the obligations of the assurer in respect of the formation of a premium reserve fund. The obligations under this head do not admit of the shadow of a doubt.

But we submit that a distinction must be drawn as to the nature of the title to this fund. The title is of two descriptions, absolutely different; the one a legal title, and the other an equitable. It is well known that the legal title is that which exists between a person and a chattel; a connection direct and immediate, of such a kind that one finds only two elements, namely, the person who is the active subject of the right, and the chattel which is its object. It exists independently of all special obligations of a third person. It is well known, on the other hand, that the equitable title is that which creates only a relation between the person to whom the ownership belongs and another person who is under an obligation to him. In virtue of an equitable title the third person cannot come directly into contact with the chattel itself, but he must apply to a person under special obligations to him in respect of this particular chattel. The efficient source of the equitable title is only this obligation. The efficient cause of the legal title is absolute conveyance.

We hold that, under the head of engagements undertaken by the assurer, under the head of the safety promised by him to the assured, and specially in that which concerns the constitution of the premium reserve, this assured has against the assurer a purely equitable claim, a claim based upon an agreement to surrender under the condition of cancelling the assurance, while the assurer, the holder in right and in fact of the reserve, is himself legal owner, and possesses over the reserve a right, direct, immediate, real. It is in virtue of this right that the assurer, to form the premium reserve fund by means of the premiums received in cash which he makes his own, makes use of his proprietary rights in investing these premiums in securities, in mortgages, for example, made out in the name of himself, the assurer, in real property acquired in the name of him, the assurer, and not in the name of the assured. It is not admissible to suggest that the ownership of the assured creates a deposit with the assurer. A deposit, in the terms of Article 1915 of the Civil Code, is an act by which one receives the goods of another, with the injunction to keep them and return them intact, *i.e.*, the transaction must have for its object the safe keeping of the goods. Now, how can we reconcile, under the hypothesis of a deposit, the use which the assurer makes, and must make, of the premiums received, with the obligations of the receiver of a deposit, as laid down in Articles 1927 *et seq.*, of the Code, especially with one which obliges (Art. 1932) the receiver of

goods deposited to restore these goods thus received in deposit *in individuo.*

There does not exist, in any way whatever, between the assured and the assurer a contract of deposit. There is, on the contrary, a contract of assurance, and this contract, exactly like the contract for an annuity, of which it is the inverse, implies a contract of sale. The assurer sells security, the assured buys it by means of a premium, which he absolutely makes over as the price of the security, as the price of the assurance. We submit, therefore, that the assurance premium is a thing absolutely conveyed for the benefit of the assurer, both in respect of that portion required to cover the current annual risk, and of that portion required to cover the future risk. We submit that the loan of a part of the reserve to the assured, or the surrender of the assurance by the assured in consideration of the payment to him of the larger portion of the reserve, would be an unintelligible transaction if the thing lent be not the property of the assurer, if the thing surrendered was not sold, retroceded to the assured by its proprietor the assurer. There is no idea of making a present to the assured withdrawing, of sums which do not belong to them. The surrender contract has nothing in common with a gift; and, even admitting that under a formal undertaking by the assurer to adopt a certain hypothetical rate of interest as the base of his operation, the assured might insist that the contract had been violated if the assurer should raise that rate, in that it would diminish the security promised to him, we would ask, on the contrary hypothesis, that is, in the hypothesis of the assurer subsequently reducing this hypothetical rate of interest which was adopted at the moment the assurance was effected, if one could admit, even for one instant, that the pretended legal right of the assured to the reserve, or even an equitable claim arising from the agreement, could be held to cover the larger fund in reserve formed by the reduced rate of interest.

We would ask how, in the case of temporary assurances, in the case of certain kinds of contingent assurances, in which there also exists a reserve of premiums, it would have been tolerated that the assurer should audaciously rob the assured in refusing all right of surrender, or of any return of a portion of the reserve, if the assured had any real legal right of ownership. As to the idea of the reserve being the property of the assured, subject to certain conditions, it cannot be entertained legally. In short, there do not exist two truths, a mathematical truth and a legal truth. Truth is one and indivisible. Although it is a mathematical conception, and although it is a contract of its own kind, assurance against death cannot alter the principles of the civil law as regards ownership, or pledge, or deposit, or trust; and there is no need for it to seek such alterations, or to place itself in opposition to these principles. We consider that the opinion according to which the premium is made over and becomes the full property of the assurer, and becomes the object of a contract of re-purchase, is absolutely correct, and does not conflict with anything, and respects the principles of law, just as it does the mathematical basis of assurance.

[The author here gives references in support of this opinion, see p. 231.]

This explanation bears testimony to the multitude of legal questions with which the special legislation, so much longed for in respect of the contract of life assurance, will have to come into contact.

Considering only the constituent legal conditions of mortgage in the case of the loan of part of the premium reserve, it is easy to recognize the great importance which underlies the declaration of the exact right of ownership in the premiums under such and such a head. We might also point out specially, among the delicate questions raised by the special nature of the contract of assurance against death, that which produces antagonism between the rights of a mortgagee in virtue of the provisions of the ordinary law in respect of a mortgage, and the public moral sentiment which rebels against putting up for sale at public auction a contract of assurance of this kind.

We think we must limit ourselves here to the foregoing short presentation of the above considerations on the numberless questions raised by the contract of life assurance, when it is brought into the presence of legislation of various nationalities, and of ordinary law from the international point of view.

III.

On the Legal Treatment of Life Assurance Companies from the International point of view.

From the international point of view the conditions of the treatment of the institutions which put into practice life assurance are marked by a diversity which proceeds either from the general legislation or ordinary law belonging to each country, or from special legislation or special regulations applying particularly to life assurance societies, home or foreign, or applying more especially to foreign companies.

It is interesting to bring under review some of the principal regulations illustrating these differences. We shall limit ourselves to mentioning those that proceed—

(1) From certain rules intended to regulate the preparation of balance sheets;

(2) From certain rules relating to deposits and to premium reserves;

(3) From certain rules relating to the extent of the powers of the representatives of foreign companies;

(4) From certain rules relating to the preparation of special statements, including only the transactions of a society entered into within a limited topographic area.

It is incontrovertible that, from the international point of view, it would be very desirable that there should exist a well-understood uniformity and reciprocity in the manner of treating the institutions which undertake insurance operations. It was in this spirit and in a more general order of ideas that, in the matter of joint-stock companies, the provisions of the Belgian law of 14 March 1855, and of the French law of 30 May and 11 June 1857, were enacted, of which the principle of reciprocity was successively extended to other countries. We say reciprocity with a definite meaning, because it must not be permitted that, by means of special restrictive laws the broad liberal spirit should be neutralized which the former laws intended. It does not appear, however, as if we were advancing actually in that direction: it seems, on the contrary, as if we were departing from

it each day more and more. We are certainly far from ignoring the inherent difficulties in the way of creating this unity, and the delicate questions which it raises; but we much regret to observe that these are being multiplied instead of a way being sought to smooth them down. To-day, far from advancing in the liberal spirit which inspired these former reciprocal laws mentioned above, it seems that the end in view is to escape from them indirectly by every kind of obstacle, by coercive measures, without thought or recognition of the indivisibility of the corporate entity—the society which transacts assurance—without thought for the liberty which should be permitted to its management, without thought, as without responsibility, on the part of the measures, often full of misapprehension, which are imposed by the authorities.

We think, in fact, that an assurance society, a corporate entity deriving its existence from a fiction of the law in the country of its origin, is an entity one and indivisible. We conceive that we can give to this thought the high character of a principle; and we think that this principle does not and should not be liable to alteration from the fact of the extension of the activity of this corporate entity beyond the country of its origin into the spheres of diverse nationalities. Even under these conditions this corporate entity must remain one and indivisible. Now, during these last few years, there have been enacted in various quarters, measures of which the character accords ill, or does not accord at all, with the perfect recognition of this unity. Among the measures of this kind we think we must include the regulations as to the conditions under which must be prepared the balance sheets, and among these we would call attention to the edicts set forth in Article 261 of the Commercial Code of Germany, repealing Articles 185*a* to 239*b* of the law of 18 July 1884. This article runs thus:

"(1) The securities relating to personal property and goods "which possess a market or fluctuating value, may be valued at the "outside at the market value at the date of the preparation of the "balance sheet, provided, however, that this value does not exceed "the purchase price, in which case they must not stand higher than "this latter figure." This article re-enacts very closely the provisions of Article 239*b* of the former law of 1884.

It is scarcely necessary to point out the remarkable consequences which, under certain circumstances, may result from this legislation, notwithstanding its good intentions. It can, in fact, at a given moment, place a life assurance society under the serious and deplorable necessity of realizing advantageous securities possessing a surplus value—first-class securities which it ought to retain so as to maintain a certain minimum rate of interest on its investments—and to do that so as to write off a fictitious and temporary deficiency, in order to avoid disclosing on the total of its investments a loss in distinct contradiction to the unrealized profits produced by the surplus value which it could realize on other securities in its portfolio, and which prudence would lead it to retain intact. If we consider the consequences of this rule to an institution which desires and which should desire investments of a first-class nature, with the intention of retaining them, we recognize that, if the securities in the portfolio were successively to be subjected to a

passing depreciation not actually realized by sale, the institution would eventually have to display, through the fluctuations of the securities retained, a considerable deficiency which might even place its very existence in danger, notwithstanding that, according to the market prices, its total securities might show a substantial surplus.

A circular issued by the Chief of the Police Department of Berlin, dated 18 May 1895, has provided only a slight relaxation of these rules in allowing an insurance society, in the event of a rise in value, to write up again among the assets to the former purchase price, the securities which it may have been necessary to write down below this price in consequence of the temporary reduction on the preceding 31 December.

Elsewhere, in Austria, there exists a Ministerial order of 18 August 1880, relating to concessions to and supervision of insurance societies by the State, followed by a second order of 5 March 1896. The various sections of this latter order relate to

(*a*) The establishment of insurance institutions;
(*b*) The organization of insurance institutions;
(*c*) The financial administration of insurance institutions (premium reserves, investments of capital, accounts, statements);
(*d*) The general arrangements of insurance institutions;
(*e*) Small mutual insurance institutions.

Included in Article 53 of the latter order are the prescribed schedules for the publication of the accounts of life assurance societies (those purely life and those having other departments of business), and in the paragraph relating to the balance sheet, assets, (Article 5) we find, according to the rules of the German Commercial Code, a direction that the values must be entered at the market price of the day on which the financial year closed, a detailed statement to be given showing also the rates of interest realized.

In this way, it may be to the interest of a society to write up its securities to the highest market price on the 31 December closing a financial year in which it might find itself subject to a temporary reduction of value on the given day, whether that reduction be accidental or not.

In addition, insurance institutions have to prepare 30 or more statistical tables, giving minute details of all kinds.

In France, and in Belgium, there do not exist narrow and special directions on the subject of the valuation of the securities in the balance sheet. The publicity given to the nature of these securities and to the prices at which they are included in the balance sheet, permits the public easily to check the soundness of the judgment displayed in the valuation of these securities, by comparing them with the market quotations on the 31 December. This means of checking is, to our mind, much more efficacious than all the imperative measures, because it is open to all and can be exercised by all the world.

We now pass on to a statement of some of the special regulations imposed either on life insurance institutions in general, both native and foreign, or particularly on foreign life insurance societies.

Since the 1st of June 1883, the Commercial Code in force in Italy has contained, in its Article 145, a direction under which "life "insurance companies and tontine societies, whether native or foreign, "must invest in the public debt and deposit with the *Caisse des*

" *Depôts et Consignations*, in the proportion of one-fourth for the " former and one-half for the latter, the amount of premiums " received and of the interest realized by the investment of the said " premiums. The method of this investment and the conditions of " withdrawing sums thus deposited, will be set forth in a royal decree." The instructions mentioned in this Article will be found in Article 55, *et seq.* of the decree of 27 December 1882.

Prussia, by an ordinance of the Minister of the Interior of date 8 September 1891, requires that " foreign life assurance companies, authorized " to transact business in Prussia, which are not German, shall be obliged " to invest in the inscribed Consolidated Prussian Debt, half of the " annual premium receipts, and the companies will not be able to deal " with the sums thus invested without the consent of the Minister " of the Interior."

Another ordinance of the 23 March 1892, extended the permission to investment of this guarantee fund in the German National Debt.

Lastly, a final ordinance of the 13 May 1892, set forth that this investment must be continued until it reaches one-half of the premium reserve relating to Prussian business.

The Grand Duchy of Luxembourg has carried the matter further, a decree of the Grand Duchy of the 20 September 1891, laying down the rule as follows, that in order to comply with the law of 16 May 1891, regarding the supervision of insurance operations:

" Assurers conducting business on human life shall make a " cautionary deposit of a fixed sum which shall not be less than " 50,000 francs, and a variable sum equal to *double* the amount of the " premiums received in the last preceding financial year."

The law of 16 May 1891 allowed the deposit to be made, in the debt of Luxembourg or in other securities, payable to bearer.

The draft law of 1895, relating to assurance societies in Norway, after having laid down the limits of investment allowed for the premium reserve, but making an exception in respect of the deposit and investment of the reserves in foreign countries, set forth, in Article 109, the deposit—

(*a*) Of the premium reserve for Norwegian assurances, less the premium reserve for that portion of risks re-assured with Norwegian societies.

(*b*) The half of the gross premium receipts of the last preceding year for the same assurances and with the same deduction.

(*c*) A supplementary reserve fund to be added to the premium reserve, calculated according to the preceding Article 50, but not less than 100,000 kroner.

According to this Article 50, the paid-up share or guaranteed capital, including the reserve fund, cannot be less than five per-cent of the premium reserves, and in the cases where the society transacts assurance against death it is further obliged to set up another reserve fund equal to, at least, one per-cent of the sums assured for this branch of business. These reserves are called surety funds for the premium reserves.

The draft law of Holland relating to life assurance, prepared by a committee appointed by a decree of 10 January 1897, and which

elaborated a report, which was presented to the Queen-Regent 27 February 1897, in addition to the Draconian directions given to companies, whether foreign or native, also proposes (Art. 74 of the draft) to insist on the former investing the reserves in real property or Dutch securities, to be deposited in the Bank of Holland, and hypothecating these as a guarantee for the contracts under the risks in force in Holland.

The same draft even included special preventive measures with respect to the representatives of foreign societies in Holland. Article No. 7 provides that "a foreign society must show that it has "named a representative, who must be endowed with the same "powers as the manager of the company: he must be authorized to "accept risks and to represent the company before the law courts." This direction has a character of serious import. In fact, the directors and managers of a company are generally named by the shareholders, and their powers are given them under the deed of settlement, and under strict limitations, and without the right to delegate them. Now, the draft Dutch law, in requiring that the representative of the foreign society should be authorized to accept risks, proposes to invest this representative with the right to conclude, on his own mere motion, assurance contracts, a right which he can only possess by a delegation, which would generally be in opposition to the provisions of the deeds of settlement of many of the societies which require the intervention of a special manager or of a director in entering into such particular assurance contracts. We could understand a provision by the Dutch Legislature requiring the signature of the Dutch representative to a contract of the society, with a view to certify or confirm the signatures of the central directorate; but it cannot be admitted that it is right to impose on a society the requirement that it should be bound by the action of a native representative which he might have taken irregularly and even in defiance of the rules of his society. There would be, in such an obligatory requirement, so autocratic, something not very consistent, or, perhaps, even entirely inconsistent, with the normal position and responsibility of the management of the society.

The requirement to invest the reserve solely and exclusively in the State funds, and to deposit it in the State bank, or in a bank named by the State, is a regrettable measure, and one of mischievous tendency, seeing that, in the case of a fall in value of the funds of the State, the amount of the premium reserve for assurances entered into in the territory of that State might be materially altered in its entirety at any given moment. (This event has happened in respect of the Italian Debt). In view of the deposit of the securities in a State bank, and the difficulties or the impossibility attending their realization, the companies are deprived of all means of taking steps in advance and guarding against the evil of a depreciation that has been expected, or of an approaching conversion. Moreover, in brief, the obligation imposed on an assurance company of investing its premium reserve fund exclusively in a national debt, constitutes a real act of interference with the management by the State, with the intention, nevertheless, of declining all responsibility. Lastly, if the investment in a national debt becomes too costly, it will no longer correspond with the hypothetical rate of interest adopted by the assurer as basis

of its operations in the assurance of human life, and it will force the company to raise its rates to the prejudice of its insuring public, and without any benefit to the public. The deposit of the premium reserves, or of part of the premium reserves, has other serious inconveniences, already justly pointed out by Mr. Harding, but we will only recall them to mind.

Passing now to special balance sheets, among all the measures which should receive attention, from an international point of view in matters relating to legislation bearing upon life assurance societies, there is none of greater importance than that of balance sheets relating to special districts. It results that in virtue of such a law, or in virtue of such administrative regulations, some particular State requires, for fiscal or other reasons, from a society the preparation of a special balance sheet relating to its operations entered into in that particular State, in order to assess, for example, the amount of taxes on the profits derived within that limited area, and separated from the total of its transactions. Now, the general mortality among the assured of a society may correspond to the hypothesis included in the mortality table adopted as the base of its transactions, or it may fall short of it, or it may exceed it. If it fall short of it, the low rate of mortality will make itself favourably felt in the resulting balance sheet. If it exceeds it, the high rate of mortality will make itself unfavourably felt. These facts will be disclosed more or less distinctly in one or other direction according to the chances of mortality in their financial aspect, and, taking account of averages, will have required the payment of a capital sum above or below the general mean of the sums assured on individual lives. We conceive that these general results cannot be rationally divided into sections. As an illustration of this, let us imagine an insurance society having its policies represented by a group of 8,987 lives of age 30 (the number living at that age by the H^M Table). The most probable number of deaths in this group during the year will be 69 according to that table. Suppose now that this group of 8,987 lives is separated into 4,000 native lives and 4,987 foreign lives, and that the actual deaths have been 50 in the native section and 20 in the foreign section. The most probable number of deaths in the native group will be 30·71. The native mortality will therefore have been unfavourable in the ratio 50 : 30·71. The most probable number of deaths in the foreign group will be 38·29. The foreign mortality will therefore have been favourable in the ratio of 20 : 38·29. The proportion between the actual mortality of the general body (70) and the most probable mortality for the same body (69) will not find itself reflected proportionally either in one or other of the sections. The mortality in the native group having been unfavourable, the balance sheet of the native business will be of an unfavourable character, may even set forth a loss, although the general course of the affairs of the society discloses, nevertheless, a profit. The sub-division of the general group may also produce the same unexpected result from the point of view of the proportions existing between the mean of the sums assured that will probably become claims and that of the sums assured actually paid. The requiring of special balance sheets is therefore irrational, and based upon false principles; and it can only lead to conclusions as preposterous as they are erroneous. We have said preposterous because it will be noticed that in our consideration of

the questions we have neglected everything that concerns an arbitrary division of the capital, of the statutory reserve, of the general expenses, &c.

The principles in the direction of international reciprocity are necessarily subject to the influence of the legislation of each individual country; and when put into practice these principles should in equity provide for the toleration of each foreign legislation, in so far as it does not produce a privileged condition for the foreign society as compared with the native society. Especially we should reject the spirit of latent hostility towards assurance institutions, and which results in their virtually being placed under an irresponsible guardianship. If we watch the actual course of events, it seems that the spirit which seeks to regulate them has a tendency to be inspired by the ancient Latin tongue which used the same word "*hostis*" to designate a stranger and an enemy. "Two sureties are better than one, and too much of that is never lost." This moral of the fable seems to have been entirely omitted from the decrees, laws, ordinances, projected or actually passed, and intended to regulate the enterprise of insurance, and specially that of foreign companies, towards which some of the regulations seem to partake of the character of a law relating to suspects, subjecting them to a sort of strangling process. Without seeking for the special motives which have resulted in the adoption of regulations of this character, it is impossible not to ask whether this series of preventive measures does not present a very mischievous side. It must specially be noted that the obligation to invest the premium reserve in State funds, with the obligation to provide supplementary guarantees, must exhaust, in some direction, the means of fulfilling obligations, and that the cost of these means must finally take the form of an increase of the rates of premium, and recoil on the heads of the assured public.

Now, it is very certain that the more the price of assurance is raised, the more the spirit of thrift is obstructed; the more the progress of the institution is kept down, the less the institution becomes accessible to the masses.

And seeing that the economic fact of the reduction in the rate of interest yielded by investments tends, by itself, to produce an increase in the cost of assurance, we can ask ourselves if the multiplication of measures of safety, over and above the normal measures required by the technical nature of assurance, which should be secured a wide publicity, is really a matter of public utility, is really opportune.

If we examine these coercive proceedings from the point of view of foreign companies, and of the principles of reciprocity, it will be found that instead of entering upon an era of benevolent reciprocity we shall introduce a regime of reciprocity of the type of that adopted in the State of Illinois, and which we shall characterize with pleasure as the retaliatory type.

"Art. 216, §19. Whenever the existing or future laws of any "other State of the United States shall require of accident life "assurance companies, incorporated by or organized under the laws "of this State, and having agencies in such other State, or of agents "thereof, any deposit of securities in such State for the protection of "policyholders or otherwise, or any payment of taxes, fines, penalties, "certificate of authority, license fee, or otherwise, greater than the

" amount required for such purposes from similar companies of other " States by the then existing laws of this State, then, and in every " such case, all accident life assurance companies of such States " establishing, or having heretofore established an agency or agencies " in this State, shall be and are hereby required to make the same " deposit for a like purpose with the State Treasurer of this State, and " to pay the auditor for taxes, fines, penalties, certificates of authority, " license fees, or any other obligation, an amount equal to the amount " of such charges and payments imposed by the laws of such other " States upon the companies of this State and the agents thereof."

We do not think that the practice of assurance can gain by the reciprocity represented by these acts of coercion, however legitimate may be measures which partake of the character of real reprisals. If it is a fact that the enterprise of life assurance can give rise to greater abuses than many other institutions, such as banks, fire insurance companies, transport insurance companies, and navigation and forwarding societies, we think, as has been justly said by M. T. van Schevichaven (see his essay on the projected Dutch Law, *Revue Baumgartner*, Vol. I., p. 600), that it is at the moment of the formation of the company that the Legislature should keep its eye open, that it is at that moment that it can usefully apply preventive measures in requiring proofs certifying to the technical and financial elements which form the solid base of the undertaking.

If supervision has a good side when it is prudent and well considered, it must not be forgotten that it may also have a very mischievous side when it is vexatious, pettifogging, and paralyzing, because the principle of such regulation partakes in certain respects of the nature of the language which Æsop attributed by turns to Xanthus—sometimes as the best of things, sometimes as the worst.

Législation des Assurances sur la Vie en France.

PAR L. MASSÉ.

A L'ÉPOQUE où le Code civil fut établi, les assurances sur la vie étaient inconnues en France, il est donc muet à leur égard, aussi bien sur les relations de l'assureur et de l'État, que sur les relations de l'assureur et de l'assuré.

En ce qui concerne ce dernier point, rien n'a été fait; quelques projets de loi ont été déposés à la Chambre des Députés où ils n'ont guère attiré l'attention de personne et malgré l'intérêt qu'il y aurait pour tout le monde à les voir discuter et aboutir, il n'est pas probable que cela se fasse d'ici longtemps. Seule une jurisprudence compliquée et souvent contradictoire règle, dans chaque cas particulier soumis aux tribunaux, les rapports entre l'assureur et l'assuré.

Quand la loi du 24 juillet 1867 qui vise les sociétés anonymes fut promulguée, les assurances sur la vie avaient pris un certain développement en France, aussi, le législateur a-t-il pensé à elles et fixé leurs relations avec l'État par le paragraphe premier de l'article 66, ainsi conçu : " Les associations de la nature des tontines et les " sociétés d'assurances sur la vie, mutuelles ou à primes, restent soumises " *à l'autorisation et à la surveillance du Gouvernement.*"

Il y a donc deux points à examiner : l'autorisation des sociétés, qui est la même pour les compagnies mutuelles ou à primes et la surveillance qui diffère selon la nature des operations.

Pour obtenir l'autorisation d'opérer en France la Compagnie qui se fonde doit déposer au Ministère du Commerce ses statuts, ses tarifs et les preuves justificatives du versement réel de son capital social ou de garantie. Ces pièces examinées sont transmises au Conseil d'État qui, à son tour, les examine, les discute et souvent les modifie. Enfin un décret présidentiel autorise la société. Ce décret soumet la société à la surveillance du Gouvernement ; il est révocable ce qui permet à l'État d'arrêter une compagnie qui violerait ses statuts ou dont le fonctionnement serait défectueux.

Le moindre changement des statuts ou des tarifs est soumis à une autorisation nouvelle.

Les Compagnies qui ont été fondées à des dates diverses avaient été autorisées par des décrets différant entre eux. Mais, l'obligation de modifier les tarifs les ayant toutes forcées récemment d'avoir recours au Conseil d'État, elles sont toutes (sauf une), identiquement autorisées.

Pour les Compagnies à primes fixes, la surveillance consistait autrefois à demander la remise d'un bilan au Ministre du Commerce et à divers autres fonctionnaires. En 1877 le Ministre trouvant insuffisant ce système, voulut imposer aux compagnies une vérification faite par un agent de l'État payé par elles; les Compagnies protestèrent et le 13 mai 1877 le Conseil d'État leur donnait raison, estimant qu'on ne pouvait leur demander autre chose que le dépôt de leur bilan.

Cet arrêt, trouvé insuffisant par le Gouvernement, fut annulé le 14 mai 1880, et remplacé par un autre qui, tout en refusant à l'État le droit d'imposer un vérificateur, lui reconnaissait celui de demander aux Compagnies de remplir des états spéciaux mettant en relief leur situation. Le modèle de ces états, demandé à l'Institut des Actuaires français, est en vigueur depuis 1894.

Les tontines et mutuelles sont soumises au régime de la surveillance par un vérificateur spécial. Comme elles sont antérieures aux compagnies à primes, leur surveillance fut établie par décret imperial du 1er avril 1809, et le 12 juin 1842, une ordonnance royale en fixa définitivement les conditions.

On voit, en résumé, que sauf pour entourer d'une certaine garantie de solvabilité le fonctionnement des assurances sur la vie en France, il n'existe aucune législation spéciale réglant ce fonctionnement.

Quant aux compagnies étrangères, elles opèrent en France avec la plus entière liberté, en vertu d'un décret du 6 août 1882. Les seules conditions qui leur soient imposées, sont d'être régulièrement constituées dans leur pays et d'opérer en France conformément aux lois françaises.

Translation.

Life Assurance Legislation in France. By L. Massé.

At the time when the civil code was established, life assurance was unknown in France, and the code is, therefore, dumb on the subject, equally with regard to the relations of the assured to the State, as with regard to the relations of the assurer to the assured.

So far as the latter is concerned nothing has been done. Several Bills have been submitted to the Chamber of Deputies, where they have hardly attracted any attention, and notwithstanding the importance to the public generally to have them discussed and carried out, that is not likely to happen for a long time to come. There only exists a complicated and often contradictory code of law to regulate the relations between the assurer and the assured, each particular case being submitted to the judgment of the tribunals.

When the law of 24 July 1867 was passed, which relates to the establishment of joint stock companies, life assurance had obtained a certain development in France, and the Legislature gave its attention to the companies, and determined their relation to the State in the first paragraph of Article 66, which runs thus—

"Associations of the nature of tontines and life assurance societies, "whether mutual or proprietary, are subject to authorization "and supervision by the Government."

There are, therefore, two points to be examined, namely—the authorization of the societies, which is the same whether for mutual or proprietary; and the supervision, which differs according to the nature of the business.

In order to obtain the authorization to transact business in France, the company about to be established must deposit at the Ministry of Commerce its articles of association, its tables of rates, and proofs of the actual payment of its share or guarantee capital. When these documents have been examined they are sent on to the Council of State, which, in its turn, examines, criticises, and often modifies, them.

Lastly, a Presidential decree authorizes the establishment of the society. This decree places the society under the supervision of the Government. It is revocable, which allows the State to stop a company infringing its articles of association, or if its working is defective.

The least change in the articles of association, or in the rates of premium, requires a fresh authorization.

Companies which were established at different dates had been authorized by decrees differing from each other, but the necessity

to change their tables of rates having obliged them all recently to apply to the Council of State, they are now all, with one exception, authorized in identical terms.

For proprietary companies State supervision formerly consisted in requiring the deposit of a balance sheet with the Ministry of Commerce, and with other functionaries. In 1877, the Ministry, considering this system inadequate, desired to compel the companies to submit to an audit paid for by them; but the companies objected, and on 13 May 1877 the Council of State decided in their favour, holding that they could not be asked for anything more than the deposit of their balance sheets.

This decision, being found unsatisfactory by the Government, was repealed on 14 May 1880, and another was substituted, which, while refusing to the State the right to nominate an auditor, granted the right to require the companies to fill in special schedules setting forth in detail their position. The form of these schedules, to which application was made to the Institute of French Actuaries, has been in use since 1894.

Tontine and mutual societies are subject to the supervision of a special auditor. As they are of earlier date than proprietary companies, their supervision was provided for by an Imperial Decree of 1 April 1809, and on 12 June 1842 a Royal Decree laid down definitely the conditions.

It is seen in brief that, except to provide a certain guarantee of solvency in the working of life assurance in France, there is no special legislation regulating that working.

As to foreign companies, they transact business with the greatest freedom in virtue of a decree of 6 August 1882. The only conditions imposed upon them are, to be legally established in their own country, and to transact business in France in conformity with French law.

Versicherungsgesetzgebung im Deutschen Reich—1895–1897.

Von DR. KARL SAMWER.

I. Das Reich.

Nach Artikel 4 No. 1 und 13 der Verfassung des Deutschen Reichs unterliegen der Beaufsichtigung und der Gesetzgebung des Reichs: "die "Bestimmungen über den Gewerbebetrieb einschliesslich des Versiche- "rungswesens" und "die gemeinsame Gesetzgebung über das gesamte "bürgerliche Recht, das Strafrecht und das gerichtliche Verfahren." Trotzdem es in Folge der Fassung des Art. 4 No. 1 scheinen könnte, als sollten öffentlich-rechtliche Normen nur des gewerblichen Versicherungswesens zur Zuständigkeit des Reichs gehören, ist man doch einverstanden darüber, dass das gesamte Versicherungswesen ihr unterliegt.

Das Versicherungsprivatrecht ist für das Reich noch nicht codificiert worden, doch steht seine gesetzliche Regelung in Aussicht. Übrigens enthalten die beiden am 1. Januar 1900 in Kraft tretenden grossen Gesetzgebungswerke, das Bürgerliche Gesetzbuch und das neue Handelsgesetzbuch, auch eine Reihe Bestimmungen, welche für Versicherungsanstalten, Agenten, Versicherungsnehmer und Begünstigte von Bedeutung sind. Nach Art. 75 des Einführungsgesetzes zum Bürgerlichen Gesetzbuch bleiben die dem Versicherungsrecht angehörenden Vorschriften der das Deutsche Reich bildenden Einzelstaaten bis auf Weiteres in Kraft, soweit nicht in dem Bürgerlichen Gesetzbuch besondere Bestimmungen getroffen sind.

Zur Festlegung der Normen des öffentlichen Versicherungsrechts ist ein entscheidender Schritt geschehen. Während das Reich bisher nur Bestimmungen für die Arbeiterversicherung[1] geschaffen und zu ihrer einheitlichen Durchführung ein Reichsversicherungsamt eingesetzt hatte, sind nunmehr im Reichsamt des Innern Grundzüge zu einem Gesetzent, wurfe über die privaten Versicherungsunternehmungen festgestellt und nicht nur im Sommer 1897 den Einzelstaaten, sondern auch im Januar 1898 einer Versammlung von Sachverständigen zur gutachtlichen Aeusserung vorgelegt worden. Man hat den Entwurf noch nicht

[1] Auf die Gesetzgebung über diese Versicherung wird hier nicht eingegangen, weil letztere den Gegenstand besonderer Berichte bildet.

veröffentlicht, und es ist deshalb unmöglich, genaue Mitteilungen über seinen Inhalt zu machen. Nach der gut unterrichteten "Zeitschrift "für Versicherungswesen" soll der Gesetzentwurf nur für solche Anstalten gelten, die ihren Geschäftsbetrieb über den Bereich eines deutschen Einzelstaats hinaus ausdehnen er soll auf dem Concessionssystem aufgebaut sein und eine besondere Reichs behörde zur Ausübung der Reichsaufsicht vorsehen; die Verhältnisse der Gegenseitigkeitsanstalten werden zum ersten Male geregelt. Es ist nicht daran zu zweifeln, dass in dem Entwurfe die Pflicht der Gesellschaften, Rechnung zu legen, nach preussischem Vorbilde festgelegt werden wird. Die Transportversicherung und die Rückversicherung scheinen nicht von dem Entwurfe berührt zu werden. Ob dieser noch im Jahre 1898 Gesetz werden wird, lässt sich nicht absehen.

Im Herbst 1897 wollte der deutsche Juristentag die Frage erörtern, welche Stellung in dem zu erwartenden Versicherungsgesetze den Versicherungsgesellschaften auf Gegenseitigkeit zu gewähren sei. Professor Dr. Victor Ehrenberg hat hierüber[1] und F. Neumann, der Herausgeber der "Zeitschrift für Versicherungswesen," hat über die rechtliche Stellung der Versicherungsanstalten überhaupt[2] ein Gutachten, erstattet. Der Juristentag hat aber die wichtige Frage bis jetzt noch nicht verhandelt, weil die geplante Versammlung im vorigen Jahre ausgefallen ist.

II. Die deutschen Einzelstaaten.

Das Königreich *Preussen* hat die Erlasse betr. die Beaufsichtigung der Lebensversicherungsanstalten (vgl. Premier Congrès International d'Actuaires, Documents, Bruxelles 1896; Report of Mr. H. R. Harding S. 10. 11. 33. 47) in einem für die Gesellschaften wichtigen Punkte abgeändert: durch Erlass des Ministers des Innern vom 5. Juli 1897 ist bestimmt worden, dass eine Übersicht der preussischen Versicherten nach Berufsgruppen nicht mehr und eine Übersicht nach preussischen Provinzen sowie nach Höhe und Art der Versicherung vorläufig nicht mehr von den Anstalten geliefert zu werden braucht. Den Gesellschaften ist damit eine höchst lästige Arbeit ohne praktischen Wert abgenommen worden.

Am 13. Oktober 1896 erliessen die drei Minister für Landwirtschaft, Inneres und Handel eine Verfügung betr. die Errichtung eines Versicherungsbeirats. Die preussische Regierung schuf hierdurch ein Organ, welches aus Sachverständigen der verschiedenen Versicherungszweige besteht und die Regierung in versicherungstechnischen Fragen zu beraten hat. Der Umstand, dass auch Sachverständige aus nichtpreussischen Staaten des Deutschen Reichs zur Mitwirkung herangezogen worden sind, hat allgemeine Anerkennung gefunden und dürfte darauf hinweisen, dass später das Reich die Staatsaufsicht gleichfalls unter Mitwirkung eines Versicherungsbeirats ausüben wird. Der preussische Beirat ist bereits mehrfach von der Regierung in Anspruch genommen worden.

Durch königlichen Erlass vom 28. September 1897 wurde angeordnet, dass im Ministerium des Innern ein versicherungstech-

[1] Verhandlungen des 24. deutschen Juristentags. I Band, Berlin 1897, Seite 63–89.

[2] Vereinsblatt für deutsches Versicherungswesen, 25. Jahrgang, Heft 11 und 12, Seite 321–411, Berlin, 1897.

nischer Hilfsarbeiter mit dem Titel "Regierungsrat,"[1] und bei den Bezirksregierungen versicherungstechnische Beamte mit dem Titel "Versicherungsrevisor" angestellt werden sollten.

Um die Ausbildung von Beamten im Versicherungswesen zu ermöglichen, hat die preussische Unterrichtsverwaltung im Herbst 1895 ein Seminar für Versicherungswissenschaft an der Universität Göttingen unter Leitung des Professors Lexis errichtet. Nach den vorläufigen Statuten werden mathematische, ökonomisch-statistische und versicherungsrechtliche Vorlesungen und Übungen abgehalten; wer dem Seminar mindestens 1 Jahr lang als ordentliches Mitglied angehört hat, kann eine Diplomprüfung als Versicherungsverständiger der mathematischen oder der administrativen Richtung ablegen. Bisher haben sich 12 Kandidaten der administrativen Klasse dem Examen unterzogen. Im Sommer 1897 zählte das Seminar 36 ordentliche und 4 ausserordentliche Mitglieder.

Schliesslich ist noch zu erwähnen, dass das preussische Stempelgesetz vom 31. Juli 1895. Pos. 70 für Lebens- und Rentenversicherungen über mehr als 3000 Mark Versicherungssumme die Zahlung eines Stempels von ein Halb vom Tausend der versicherten Summe in Abstufungen von 10 Pfennig für je 200 Mark oder für einen Bruchteil dieses Betrages verlangt. Bei Rentenversicherungen wird der Kaufpreis und in Ermangelung eines solchen der zehnfache Betrag der Rente als Versicherungssumme angesehen.

Im Königreich *Württemberg* haben die gesetzgebenden Körperschaften im Laufe des Jahres 1897 ein Einkommensteuergesetz, welches auch die dort ihren Sitz habenden Gegenseitigkeitsanstalten zur Steuer heranziehen will, und eine Polizei-Strafnovelle beraten. Nach letzterer soll straffällig sein: 1, wer Aussteuer-, Sterbe- oder Witwenkassen, Versicherungsanstalten oder ähnliche Gesellschaften eröffnet, ohne die durch Verordnung vorgeschriebene Anzeige erstattet zu haben; 2, wer denüber den Geschäftsbetrieb durch Gesetz oder Verordnung erlassenen Vorschriften oder der durch das Ministerium des Innern verfügten Untersagung des Betriebs zuwiderhandelt; der Betrieb kann untersagt werden, wenn die Interessen der Versicherten gefährdet oder behördliche Vorschriften fortgesetzt gröblich verletzt werden. Gegen die Untersagung des Betriebes ist die Rechtsbeschwerde an den Verwaltungsgerichtshof zulässig. Selbstverständlich werden diese Bestimmungen ausser Kraft treten, sobald das künftige Reichsversicherungsgesetz wirksam wird.

Für das Grossherzogtum *Baden* ist auf Grund des dortigen Polizeistrafgesetzbuchs § 134 *d* eine Ministerialverordnung vom 26. September 1896 ergangen, welche die Ministerialverordnung vom 31. Oktober 1894 zwar formell aufhebt, aber deren Vorschriften für Lebensversicherungsanstalten einfach wiederholt.

Das Grossherzogtum *Hessen* hat in dem Gesetze vom 25. Juni 1895, die allgemeine. Einkommensteuer betreffend, Artikel 19 No. 7 bestimmt, dass bei der Feststellung des steuerpflichtigen Einkommens in Abzug gebracht werden können Versicherungsprämien bis zu 400 M. jährlich oder Teile von solchen Prämien bis zu diesem Betrage, welche für die Versicherung des Steuerpflichtigen auf den Todes- oder Lebensfall gezahlt werden. Schon vorher hatten das Königreich *Preussen* in dem

[1] Diese Stelle ist dem früheren Repräsentanten der Lebensversicherungsgesellschaft "Germania," Herrn Marschall von Bieberstein, übertragen worden.

Einkommensteuer Gesetze vom 24. Juni 1891 §. 9 I No. 7 und das Fürstentum *Schwarzburg-Sondershausen* in dem Einkommensteuer-Gesetze vom 1. Februar 1894, §. 9, No. 6, die gleiche Bestimmung getroffen, und zwar Preussen für Prämien bis zu 600 Mark, Schwarzburg-Sondershausen für Prämien bis zu 300 Mark.

Das Fürstentum *Schwarzburg-Sondershausen* hat ferner in dem Gesetze vom 23. Juni 1897, die Besteuerung der Versicherungs-Anstalten betreffend, die Versicherungs-Aktiengesellschaften einer Steuer von 3 vom Hundert der aus dem Fürstentum bezogenen Prämien unterworfen. Hiergegen ist der aus 42 Anstalten bestehende Verband deutscher Lebensversicherungs-Gesellschaften am 29. Januar 1898 vorstellig geworden.

Das Reichsland *Elsass-Lothringen* setzt in dem Stempelgesetze vom 21. Juni 1897 zunächst verschiedene Stempelabgaben fest: in §. 19 No. 2 für die landesherrlichen Erlasse, durch welche Lebensversicherungsgesellschaften oder Tontinen bestätigt werden, 100 Mark; in §. 19 No. 3 für die landesherrliche Genehmigung von Statutenänderungen solcher Gesellschaften 50 Mark; in §. 19 No. 4 für die Veröffentlichung der Wohnsitzerwählung fremder Versicherungsgesellschaften bei erstmaliger Wohnsitzerwählung 500 Mark und bei Veränderungen 20 Mark; in den §§. 42 und 43 für Versicherungsverträge eine jährliche Abgabe von 2 vom Tausend der Prämien oder einen einmaligen Stempel, der nach der Versicherungssumme berechnet wird (2/10 bis etwa 10/10 vom Tausend des versicherten Kapitals). §. 44 Abs. 1 behandelt die ausserhalb Elsass-Lothringens ausgestellten Policen, §. 45 die Erfüllung der Stempelpflicht. §. 47 bestimmt, dass die Versicherungsanstalten vor Beginn des Geschäftsbetriebes eine Erklärung abzugeben haben, welche die Art ihrer Geschäfte und den Namen des Vorstandes der Hauptniederlassung zu enthalten hat; Wechsel in dem Ort der Hauptniederlassung und in der Person des Vorstands sind gleichfalls anzumelden; ferner sind in ein Repertorium am Orte der Hauptniederlassung die durch elsass-lothringische Agenten vermittelten Versicherungen und alle Statutenänderungen einzutragen; dieses Repertorium ist dem Verkehrssteueramt vierteljährlich und ausserdem ebenso wie andere auf Versicherungen bezügliche Schriftstücke auf Verlangen jederzeit vorzulegen. §. 55 setzt Geldstrafen fest für die Nichterfüllung der den Versicherungsanstalten obliegenden besonderen Verpflichtungen.

Die Ausführungsbestimmungen, welche das elsass—lothringische Finanzministerium am 24. Juni 1897 zu dem Gewerbesteuergesetze vom 8. Juni 1896 erlassen hat, erklären in dem letzten Absatz des Art. 8 für steuerpflichtig die auf Gegenseitigkeit gegründeten Versicherungsgesellschaften, wenn auch der erzielte Gewinn in Form von Prämiengewährung an die Mitglieder verteilt oder zur Kapitalansammlung benutzt werde. Es können hierunter nur diejenigen Gegenseitigkeitsanstalten verstanden werden, welche auch die Versicherung gegen feste Prämie betreiben und hierin einen Gewinn erstreben. Die auf reiner Gegenseitigkeit beruhenden Versicherungsgesellschaften haben keine Gewinnabsicht und betreiben deshalb kein Gewerbe; sie sind auch in dem elsass-lothringischen Gewerbesteuergesetze nicht für steuerpflichtig erklärt worden.

Translation.

Insurance Legislation in the German Empire, 1895–1897.

By Dr. Karl Samwer.

I.—The Empire.

According to Article 4, Sections 1 and 13 of the Constitution of the German Empire, the "regulation of trade, including insurance business", and "general legislation affecting all civil laws, penal laws and legal proceedings", are subject to the supervision and legislation of the Empire. Although it might seem from the construction of Article 4, Section 1, that the regulation of proprietary insurance only is under the legislative control of the Empire, yet it is admitted that every description of insurance business is included.

The civil laws relating to insurance have not yet been codified for the whole Empire, but there is a prospect of this being done. The two great legislative works, the code of civil law, and the new code, which come into operation on 1 January 1900, also contain a number of regulations affecting insurance companies, agents, insurers, and beneficiaries. According to Article 75 in the introduction to the municipal code, the laws relating to insurance in each of the States forming the German Empire remain in force until further notice, unless contrary regulations are contained in the civil code.

A decided step has been taken towards settling the basis of general insurance legislation. Hitherto the Empire has only made provision for—State insurance of workmen*, and has established an Imperial department for its uniform management; but there are now in the Imperial Home Office outlines of a bill concerning private insurance undertakings. This Bill was subjected to the judgment of the individual States in the summer of 1897, and in January 1898, to an assembly of experts. It has, however, not yet been published, and we cannot therefore describe its contents. According to the well-informed *Zeitschrift für Versicherungswesen*, the Bill will only be applied to those companies which do business beyond the boundary of a single German State. It is constructed upon the concession system, and a special Imperial office is provided for the exercise of Imperial supervision; the affairs of the mutual companies will be for the first time regulated. There can be no doubt that in the Bill the duty of the companies to deposit accounts on the Prussian model will be enforced.

* The legislation on this branch of insurance has not been described here, as it forms the subject of special reports.

Transport-insurances and re-insurances appear not to be affected by the Bill. Whether it will become law in the year 1898 cannot be predicted.

In the autumn of 1897, the German Lawyers' Assembly wished to discuss the question of the position which mutual insurance companies should occupy in the expected insurance legislation. Dr. Victor Ehrenberg* has expressed an opinion on this subject, and F. Neumann, the editor of the *Zeitschrift für Versicherungswesen*, has written† on the legal position of insurance companies generally. The Lawyers' Assembly has, however, not yet dealt with this important question, because the meeting arranged last year did not take place.

II.—The German Individual States.

The Kingdom of Prussia has altered the decrees respecting the supervision of life insurance companies (*see* Premier Congrès International d'Actuaires, Documents, Bruxelles, 1896. Report of Mr. H. R. Harding, pp. 10, 11, 33, 47) in one point of importance to the companies. By a decree of the Minister of the Interior, dated 5 July 1897, the companies will no longer be required to furnish returns of lives insured arranged according to occupations, residences, sums insured, or classes of insurance. A very burdensome task of no practical value is thus removed.

On 13 October 1896, the three Ministers for Agriculture, the Interior, and Trade, issued an order respecting the formation of an Insurance Council. The Prussian Government thus formed a body of experts in the various branches of insurance to advise the Government upon technical points. The fact that experts from the non-Prussian States of the German Empire have been invited to assist has given general satisfaction, and seems to indicate that the Empire also will before long exercise State control with the assistance of an Insurance Council. The Prussian Council has already been frequently consulted by the Government.

By a Royal decree of 28 September 1897, an assistant, skilled in insurance matters, was appointed in the Ministry of the Interior, with the title of "Government Adviser",‡ and expert officials in the provinces entitled "Insurance Revisors."

To facilitate the education of experts in insurance matters, the Prussian Educational Office established a seminary in the autumn of 1895 for the Science of Insurance, at the University of Göttingen, under the direction of Professor Lexis. Lectures and exercises are given on mathematical, economic, and insurance subjects; those who have been regular members of the seminary at least one year can undergo an examination for a diploma, qualifying them to act in the mathematical or administrative departments of insurance business. Up to the present time 12 candidates in the administrative class have passed the examination. In the summer of 1897, the seminary contained 36 ordinary and four extraordinary members.

* Proceedings of the German Lawyers' Assembly. Vol. I, Berlin, 1897, pp. 63-89.

† *Vereinsblatt für Deutsches Versicherungswesen.* 25th year, Parts 11 and 12, pp. 321-411. Berlin, 1897.

‡ Mr. Marschall von Bieberstein, formerly representing the "Germania" Office, has been appointed to this post.

We may remark, in conclusion, that the Prussian Stamp Act of 31 July 1895 imposes on life and annuity policies above 3,000 marks (£150) a stamp of $\frac{1}{20}$ per-cent of the sum insured, graduated to 10 pfennig for each 200 marks or fraction thereof. In the case of annuities the duty is charged on the purchase money; or, in default of this, 10 years' purchase of the annuity.

In the Kingdom of Württemberg the legislative corporations, in the course of 1897, deliberated upon a tax on incomes, to which the mutual companies established there will also be subject, and upon a Bill involving legal supervision. By the latter, penalties will be incurred: (1) If anyone starts an insurance company without having given the prescribed notice; (2) If anyone acts contrary to any law or decree issued for the regulation of the business, or to any prohibition by the Minister of the Interior: the business may be prohibited if the interests of the insured are endangered or official instructions persistently and grossly neglected. Against the prohibition of the business an appeal is permitted to the Administrative Court. These regulations will, of course, cease when the Imperial insurance law comes into operation.

For the Grand-Duchy of Baden, a Ministerial decree of 26 September 1896, has been issued on the authority of the Penal Code § 134 d, which formally cancels the Ministerial decree of the 31 October 1894, but simply repeats its provisions for life insurance companies.

The Grand-Duchy of Hesse, in the law of 25 June 1895, concerning income tax (Article 19, No. 7), decreed that in the assessment of income tax a deduction may be made for insurance premiums up to 400 marks (£20) per annum for insurance on the life of the taxpayer. Similar deductions had been previously allowed in the Kingdom of Prussia (24 June 1891), and in the Principality of Schwarzburg-Sondershausen (1 February 1894); the allowance in Prussia being up to 600 marks (£30), and in the Schwarzburg-Sondershausen 300 marks (£15).

This latter Principality has further, by a law dated 23 June 1897, placed a tax of 3 per-cent on the premiums obtained by proprietary insurance companies from the Principality. The association of 42 German life insurance companies protested against this on 29 January 1898.

The Province of Elsass Lothringen, by a Stamp Act dated 21 June, 1897, fixed various stamp duties: in § 19, No. 2, 100 marks (£5) for the Government edicts by which life insurance companies or Tontines are established; in § 19, No. 3, 50 marks for the consent of the Government to alterations of the rules of such companies; in § 19, No. 4, for notification of the opening of offices by foreign insurance companies, 500 marks, and on each subsequent change of residence 20 marks.: in § § 42 and 43, for insurance contracts, an annual tax of 2 per 1,000 of the premiums, or a single stamp calculated on the sum insured (from $\frac{2}{10}$ to about $\frac{10}{10}$ per 1,000 of the same); § 44, ch. 1, deals with policies issued outside Elsass Lothringen; § 45 with the collection of the stamp duty; § 47 orders that insurance companies, before commencing business, must make a declaration describing the business and giving the name of the manager of the head agency, Changes in the locality of the head agency and in the management are

alike to be communicated. Moreover, a register must be kept at the chief agency of all insurances effected through Elsass Lothringen agents, and all changes in the rules; this register must be produced quarterly to the Revenue Office, and at any other time on demand; § 55 fixes fines for non-performance of the special duties incumbent on insurance companies.

By regulations which the Elsass Lothringen Finance Ministry issued on 24 June 1897, for carrying out the Industrial Tax Act of 8 June 1896, insurance companies founded on the mutual system are liable to the tax if the profits are applied to reduce the premiums or to increase the sums insured. In this class, are included only those mutual companies which effect insurances for fixed premiums with a view to profit.

The purely mutual insurance companies do not seek for profits and therefore do not carry on any trade, and are declared not liable to taxation under "The Elsass Lothringen Industrial Tax Act."

Life Assurance Legislation in Holland. The General Principles of the Laws concerning the Assurance Contract, and those regulating the constitution of Life Assurance Companies. Actual situation and apparent tendencies. By J. F. L. Blankenberg, *one of the Managers of the Algemeene Maatschappij van Levensverzekering en Lijfrente, Amsterdam.*

There exists in Holland no Life Assurance Companies legislation, properly so called. In the course of this paper the apparent causes of this regrettable fact will be fully explained. But, however, it *is* a fact not to be denied.

The law is aware of the existence of such a thing as life assurance only in the commercial code, the Ninth Section of the First Book of which deals with several assurance matters, life assurance included; its Tenth Section, Third Division, is devoted to life assurance. The whole set of regulations given in these sections, is so restricted, that it can be reproduced here (in translation) without fear of overweighting this paper. I imagine that none of my fellow-reporters on the life assurance legislation in different countries will be able to do the same thing; but also no country has enclosed legislation on this subject in a nutshell, as Holland has.

Here is the complete statement.

Commercial Code (1838).

Ninth Section.—On Assurance in general.

Paragraph 247. The object assured can be, amongst others . . . . . the life of one or more persons.

Paragraph 250. The assurer shall not be liable, if he who has effected an assurance for his own account, or he for whose account an assurance has been effected by another, has no interest in the object assured at the date of the contract.

Paragraph 251. Any erroneous or untrue declaration, or any concealment of particulars known to the assured, even if made in good faith on his part, and being of such a character that the assurance would not have been effected, or not on the same terms if the assurer had known all the exact particulars, causes the assurance to be void.

Paragraph 255. The assurance shall be made in writing, by a deed (document), bearing the name of *policy*.

Paragraph 271. The assurer can always re-assure what he has assured.

Tenth Section. Third Division.—On Life Assurance.

Paragraph 302. The life of any person can be assured for the benefit of a party interested, either for the whole duration of life, or for a term to be defined at the date of the policy.

Paragraph 303. The party interested may effect the assurance even without the knowledge or consent of the person whose life is to be assured.

Paragraph 304. The policy must set forth—

1. The date on which the assurance is effected;
2. The name of the assured;
3. The name of the person whose life is assured;
4. The date of the commencement and that of the end of the risk;
5. The sum assured;
6. The premium for the assurance.

Paragraph 305. The determination of the amount and conditions of the assurance depend entirely on the convenience of the parties concerned.

Paragraph 306. The contract is void if the person whose life is assured should already have died at the moment when the assurance is effected, even if the assured could not have had knowledge of the said death, unless a stipulation to the contrary should have been made.

Paragraph 307. The contract is void if the person whose life is assured commits suicide or is sentenced to death.

Paragraph 308. This section does not include widow-funds, tontines, mutual companies, or other similar institutions, based on life-and-mortality probabilities, requiring an entrance fee or determinate contributions, or both.

The first thing which will strike the impartial observer will be, no doubt, the date of the Commercial Code. It dates, indeed, from the year of grace 1838, that means 60 years ago.

There can scarcely be any better opportunity for quoting the French proverb, "Il faut juger les écrits d'après leur date", than in the case of this legislation.

Life assurance, though an institution born in Holland through the learned and practical (qualities seldom seen in each other's company!) studies of the statesman Johan de Witt (1625-1672), closely followed by those of the genial Christian Huyghens (1629-1695) and those of the Burgomaster of Amsterdam, Joannes Hudde (1663-1704), was, nevertheless, not early cultivated in this country, the honour of promoting this wonderful application of science to practical daily life having been left to our English neighbours. The

researches and calculations of the above-named men, found their application here in the determination of the rates at which Government annuities could be granted to persons of different ages.

The Government, in those days, raised money for the public service by granting annuities payable during the lives of the subscribers; the rate at which these annuities were sold, used to be uniform for every subscriber, without having regard to his age. The investigations (principally) of De Witt into the rates of mortality prevailing among the people, brought to light the measure by which the charges for these annuities should be higher in the case of older subscribers, and lower in the case of younger ones, although that measure was not applied until later years.

But life assurance, *i.e.*, the assuring of a certain amount payable at death, in consideration of the payment of an annual sum (premium), was not practised in Holland before 1807, the year in which the first Dutch life assurance company was founded. A second company was established in 1818, a third one in 1823, followed by no other before 1840. There was, in consequence, at the time of the promulgation of the law (1838), no large development of the business; life assurances were seldom taken out, and the business was only in its infancy.

This accounts for the strangeness and peculiarity of some of the regulations laid down in the commercial code. For instance, Paragraphs 250, 303, 306 and 308, seen in the light of our present knowledge, seem rather remarkable, not to say ridiculous. To limit life assurance to an indemnity (250), to suppose that an assurance can be effected without the co-operation of the life concerned (303), to admit the possibility that a life to be assured could have died, and an assurance could be still effected notwithstanding (306), to exclude widow funds, mutual life companies, and similar institutions (308), could only be possible in a period when the knowledge of the matter was very limited.

But, to be just, we must recognize that the Government was well aware of the importance of the subject. In other European countries life assurance was much spoken of; in England, France, and Germany several companies had been founded that extended their operations to Holland, where the interest taken in life assurance was becoming more active. Small annuity funds, widow funds, and tontines were established here and there, and it need not be said that amongst the promoters of these institutions, some people of doubtful character were to be found.

For this reason, the Government promulgated a royal decree, dated the 16 July 1830, which was intended to settle matters, and to lay down rules to be observed on the establishment of life assurance companies and other similar institutions.

By this royal decree it was ordered, that no life company can legally exist, unless it has been authorized by the King. A delay of nearly six months was granted to the companies already in operation, during which they might bring themselves into conformity with this decree.

But it appeared very soon that the rules of this decree were useless on account of their indefiniteness. A second royal decree, dated the 2 May 1833, therefore, tried to be more explicit. It laid

down the following requirements to be observed in applying for the royal authorization.

Every project for a new company was required to contain adequate provisions as to the soundness of the mathematical basis; the mode of election of the managers and trustees, and their rights and duties; the investment of the funds of the company, and the part which the trustees have to take in dealing with investments; the obligation of the managers to give security for their management; to report yearly on the income and outgo of the company, and quinquennially on all the assets and liabilities by way of a valuation; the power of the members to modify the bye-laws; the mode of settlement of differences between the members and the trustees and the managers; the penalties to be incurred by the members in case of delay in the payment of their premiums, and in case of discovery of untrue declarations; the efficient selection of lives in order to prevent an adverse deviation from the table of mortality; the most equitable mode of distribution of the assets in the case of dissolution of the company; and last, not least, the stipulation for a maximum percentage of loading on the premiums, to provide for the costs of the management, and the destination of this percentage.

A further royal decree, dated the 10 July 1840, prescribed that no mutual company should be allowed to start business without having five hundred adherents at the beginning.

And, to crown this whole series of autocratic regulations, two special royal decrees, also of date 10 July 1840 (No. 42 and 43) were promulgated, the first publishing a list of four companies which were not judged fit to receive the royal authorization, the second giving the names and addresses of eleven companies which, after examination by Government, in conformity with the rules laid down in the royal decree of 2 May 1833, were found to be working on sound principles, and repeating the names of the four companies of unsound constitution to be avoided by the public.

On the 9 December 1845, another royal decree was promulgated, extending all the foregoing regulations to such institutions as should assure capital sums, annuities, &c., to be paid in the case of other contingencies than the death of the assured.

This attempt at regulating life assurance matters, though deserving a kindly notice on account of the apparent earnest desire to act for the good of the public, proved, however, to be a complete failure.

Whilst the stipulations of the commercial code had no influence whatever, the royal decrees had the effect of restricting the business of life insurance within the most narrow limits.

Government was, of course, assisted in the examination of the draft constitutions of new companies by a technical officer. There was generally appointed to this post one of the professors of mathematics at the Polytechnic School at Delft, whose ordinary vocations consisted of dealing with mere mathematical, astronomical, and similar subjects, but for whom the theory and practice of life assurance was quite a thing apart, and entirely out of his usual occupations. The consequence of this arrangement could be no other than this, that the learned professors, who had not the slightest notion of the practice of life assurance, nor of the hundreds of actuarial questions in which

the profession here and abroad is interested, based their recommendations to the Government on pure theory, and did not, in any way, pay attention to the practical side of the business, nor to the conditions under which it had been carried on.

This system resulted, practically, in the Government prescribing (1) the tables of mortality to be used; (2) the rate of interest; (3) the loading on the premiums for each table separately; (4) the mode of division of profits; (5) several other arbitrary stipulations concerning the internal constitution of a company.

We need not point out that such a course placed the Dutch companies on a footing of inequality as regards foreign ones, and entirely thwarted every effort of men of energy to promote this (then) new branch of commercial enterprise. The autocracy of the Government went even so far as to prohibit any company to extend its sphere of business to foreign countries, amongst which our own Dutch colonies were included.

The motives of the Government for such a policy were exclusively derived from considerations of general safety, the royal decrees prescribing preventive measures—they thought it to be their duty to supervise every part, even the smallest of the undertaking. And, in the case of their approving of the same, they held themselves morally responsible for its safe and reliable working, so that they felt themselves obliged to be as exacting as possible.

And, moreover, as Government considered life assurance to be a trust, not a trade, and preferred a solid edifice, even if no one could inhabit it on account of its antiquated architecture, to a modern one, as solid as any building could be, but built in modern style, they prescribed such tables, and such rate of interest, and such other conditions, that the premiums, so calculated, were 50 per-cent too high, and the conditions of assurance a hundred years in arrear, compared with those of the best foreign companies.

Foreign competition was entirely disregarded by the Government. If the lower premiums of foreign companies caused much Dutch money to go abroad, the policies paid by them to Dutch assured would return it to Holland!

Different tables of premiums, *with* and *without* profits, could not be sanctioned, because, if the Government should admit this, it would seem as if a certain amount of profit were guaranteed—something unnatural and impossible in itself.

Neither could extra premiums for special risks be tolerated, the statistics available for the calculation of such premiums being of very little value, and giving no absolute security. The rates of extra premiums were considered as based on a very uncertain foundation, and no element of uncertainty should be allowed to enter into the fortress of life assurance! Moreover, the general mortality statistics include, for instance, healthy and unhealthy people, and all professions, so that, on that account, the charging of extra premiums could not even be *justified*.

And so on; all theory; not one little bit of practice!

To this autocratic policy absurdity was added. For the same Government that interfered in such a despotic way in the free action of a free profession, the same Government that regulated every detail before giving its sanction to the foundation of a company, did not

look after it afterwards. The royal authorization being granted, the tables of premiums, &c., being approved, a company was at liberty to do what it liked. Government did not interfere any more. The valuation of the reserves, the control over the investments, over the expenses of management, over the management itself, and over the many details that have the most far-reaching influence on the welfare of a company, were not cared for, even in the least degree.

In a system of regulating everything, such a permanent survey cannot be dispensed with, and it seems an absurdity to forget it.

Still more astonishing was the Government's policy in the case of foreign companies. Where native companies were muzzled and tyrannized over in the way described, not the slightest supervision, not the least obstacle, was set up against foreign companies. They could establish themselves here without further notice, were not bound to apply for any preceding authorization from the Government, not even to notify their presence. They were as free as a bird in the air; they could legally do everything they liked; they could offer premiums, conditions, profits at such a rate as they thought most fit; they were thus placed by Government itself on a level of superiority over native institutions!

The tree is known by its fruit, and what was the fruit? That the Dutch companies were prevented from obtaining a reasonable extension of their business, and from securing their legitimate share in the rising interest which the general public showed towards life assurance; that foreign companies came in scores to Holland, opened agencies, and did a splendid business, to the detriment of their Dutch rivals; that there was a nearly complete standstill in the development of this branch of business amongst native companies, and in the practical application of actuarial science; that, in consequence, the whole profession steadily declined.

The very measures, taken with a view of promoting the beneficent business of life assurance, proved thus to act directly against it, and to bridle Dutch enterprise, to the benefit of foreign companies which were of the most enviable and undisputed strength.

The whole system thus proved a complete failure.

But a most auspicious event occurred on the 12 April 1880.

The High Court of Justice decided, on that memorable day, in the case of the State *versus* a small industrial company, that the whole set of decrees had no legal sanction, that is to say, that the Crown had no right to promulgate the different regulations. Such a right belongs only to Parliament; *i.e.*, no royal authority, no executive Government, has power to regulate what only the legislative body, the direct representation of the people, has a right to prescribe, in accordance with the constitution of the kingdom.

This judgment practically set the royal decrees aside, and annihilated their binding power. It was received in assurance circles with unconcealed satisfaction; the measures hitherto taken by the Government in such an unthinking and unjustifiable way, were now practically, though not officially, abolished; the freedom of commercial enterprise was regained, and the obstacles against the greater development of the business in general, and each company in particular, fell to the ground.

From this date a strong revival, a powerful development, of the

business took place. Immediately after the judgment of the High Court of Justice, two fresh companies were started, and up to the present date some eight others have followed. Competition thus increased, and each company had to take its part in the general activity. Native companies, taking advantage of their own and of foreign experience, regained the ground hitherto lost, and made a good start towards greater prosperity.

But at the same time, the companies themselves were well aware that, after the invalidation of the royal decrees, not the slightest regulation of a legislative character existed. They were of opinion that such a state of things was entirely unsatisfactory, and could by no means contribute to the durability, soundness, and prosperity of the business.

The regulations of the commercial code, defective and insufficient as they might be, stood unshaken and remained in force. But they only related to the contract of assurance. The business, the management of companies, were left wholly without legal definition; no rules were laid down concerning the constitution, the management, the accounts, of the companies.

This absence of legislation also moved the Government to take the matter in hand. It appointed, on the 4 October 1883, a Royal Commission in order to study the subject and to give its advice, in the preparation of a Life Assurance Companies Act. This Royal Commission was composed of three members, one of whom was the manager of a life company, the second a professor of mathematics at one of the Universities, and the third a Government official. They prepared a draft Bill and an explanatory report, and presented them to the King on the 15 May 1885.

However, the pains taken by this triumvirate were all in vain. Each of the three members had his own peculiar opinion on several of the main principles, as well as on some of the details; so that the common report represented at the most the minimum recommendations on which they could agree in the end.

This result was so much the more to be deplored, as the principal recommendation of the commission was the introduction of the English system—freedom and publicity, with some necessary deviations.

The Government never submitted the draft Bill to Parliament, so that nothing was done, and the state of complete absence of legislation continued to exist.

Meanwhile the managers of the principal life companies, having formed a union in order to promote their mutual interests and to discuss general business matters at periodical meetings (a sort of Life Manager's Association), placed the question of the absence of legislation, at the head of the list of subjects to be discussed.

At one of the first meetings after its foundation (5 March 1887), held on the 22 December 1887, and continued on the 19 January, 16 February, 8 May, and 12 June 1888, the members of this association expressed by unanimous vote their opinion, that it must be considered of the highest importance, as well to the companies as to the public, that a Life Assurance Companies Act should, without further delay, be prepared and submitted by the Government to Parliament.

The council of the association forwarded to the members of Her Majesty's Government, and to all the Members of Parliament, but more especially to the Home Secretary, to whose department life assurance matters belong, the decision of the association; and respectfully explained to the latter, that a longer continuance of the present undefined position would be of great prejudice to the active and sound development of the regenerated business. They handed in a complete scheme of suggestions, which ought, according to their opinion, to serve as the basis of new legislation, which should not interfere with the rights of self-reliant enterprise, and at the same time which should give ample security to the public against bad management and the neglect of the interests of the assured.

This appeal to Government remained ineffectual for a long time.

Years came and went, and nothing was done. It seemed that after the unsuccessful work of the Royal Commission, courage was exhausted, and matters were allowed to drift, leaving everything to fortune and waiting for more auspicious times.

Seven years passed by, and no opportunity was lost by the companies of insisting on the final regulation of the matter by law; the assurance press followed this example and sang the same song to their own tune; the general press joined in the chorus and here and there the public began to show some interest, until Government could no longer maintain a passive attitude, but was compelled to make some move.

At this time several complaints arose against some "burial societies", as they are called in Holland, which have much resemblance to the British friendly societies. No legislation existed either for these institutions, and a private investigation, supplemented later on by an official one ordered by the Government, had pointed out the absence of and necessity for legislation in regard to these societies.

For the purpose of making recommendations as to the measures to be taken, the Government appointed a second Royal Commission on the 4 April 1892. After having been some time at work, this Commission,—which lost successively half its members by death, these being replaced by other members holding opinions opposite to those of their predecessors,— asked the Government to extend its mandate, and to authorize it to prepare a draft of a bill concerning the business of life assurance in general. By royal decree of the 10 January 1895, this request was granted, and it was in the early days of 1897 that the report of this Commission was presented to the Queen-Regent, and thereafter published by the Government.

The Royal Commission, after its renewed composition, consisted of five members, viz.: a professor of jurisprudence acting as a president, a professor of mathematics, a doctor of medicine, a manager of a mutual life company working on the trust plan, and a lawyer, doctor juris., acting as secretary. A Government official was appointed assistant secretary.

The recommendations, laid down in the report were (in outline) the following:

A. Concerning the Foundation of Companies.

That only companies, whether proprietary or mutual, that are actually incorporated should be authorized to transact life assurance business.

That no special authorization should be required as to premium rates, conditions of assurance, or other such matters.

That before starting a company, a deposit to the value of at least fifty thousand guilders should be invested in the national debt, which deposit should be returnable only in the case of liquidation or winding up, and then only on presentation of a certificate, authorizing the same, granted by a competent authority. This deposit would serve in the first place as a guarantee for the liabilities of the company, and should not be assignable or liable to seizure. This deposit should not be required in the case of mutual societies, established solely for the benefit of persons engaged in the same trade, or in allied trades, or in the case of workmen's unions, insuring the members, their wives, their children, or other members of their families.

B. Concerning the Conduct of the Business.

That the managers of a company should be bound to keep a register, in which the assurances should be inscribed in chronological order, and in such a way, that the mutual obligations of both parties clearly appear. Every change affecting any assurance, and every lapse, should be recorded in the same manner.

That to each assured a policy of assurance should be delivered, the principal particulars which such policy should include being enumerated in the draft. In the case of an assurance effected on the life of an unborn child, the setting forth in the policy the names of the father or mother should be sufficient.

That if the premium be not paid when due, the assured should be served with notice, by registered letter, requiring payment within a fortnight. Should payment not be made within a month of the due date, the assurance should be considered to be cancelled, with this proviso, that if the policy had been in force during three years, the company should be bound either to grant a paid-up policy for the amount which 80 per-cent of the reserve value on the day of cancelment would secure, or to pay a surrender-value in cash of 75 per-cent of the reserve value. But the liability of the company should cease if the assured do not put in his claim within a year.

That each company should be bound to draw up a balance sheet and a revenue account within six months of the close of the financial year, in a form prescribed by a competent authority.

The balance sheet should include more particularly the following items:

1° The balance of establishment and other expenses, and of commissions not fully written off within the financial year;

2° In separate lines the deposit of 50,000 guilders—the real estate, the stocks and bonds, the loans on policies, the mortgages, the cash in hand, the balances at the bankers, the agency balances, and other outstanding credits, indicating in each case any doubtful assets;

3° The different reserves enumerated separately among the liabilities.

A printed yearly statement should, on payment of a trifling sum, be delivered to everyone applying for it within six months after the end of the year. This statement should contain the following information:

(*a*) A list of shareholders (if any) who hold shares not fully paid-up, mentioning the amount of their uncalled liability.
(*b*) The revenue account.
(*c*) The balance sheet.
(*d*) A list of the investments, giving the most minute details.
(*e*) A summary of the average rate of interest earned upon the investments during the last ten years.
(*f*) A summary of the expenses of management.(*)
(*g*) The amount of establishment and other expenses and commission not written off; each item to be shown separately.(*)
(*h*) The valuation basis, more especially the loading, the rate of interest assumed, and the table of mortality used(*); also the name of the actuary.
(*i*) A schedule, containing full particulars of the amount assured, lapsed and in force; re-assurances to be mentioned separately.
(*j*) Several other schedules relating to the number assured under each table, the average amount of the policies, the expected and the actual mortality, and a classification of the assured with the amounts assured according to age.
(*k*) A statement of the different reserves shown in the balance sheet, with the method of calculating them.
(*l*) A statement concerning the realized profits and their distribution, and, finally, in the case of a company transacting other business than life assurance, a full statement of that other branch for the past year, with revenue account and a balance sheet (the information marked thus (*) also to be given for the Dutch business separately). This list of requirements can be altered by Royal Authority, on the advice of the competent committee.

That the valuation of the liabilities of the company should be, made at least quinquennially.

There were also stringent recommendations regarding assurances on children under four years of age, limiting the amount to be assured (whether in one or more companies) on any one life to a small sum, and laying down minute rules to be observed before making any payment.

C. Concerning the Supervision by The State.

That there should be a special committee instituted under the Home Department, whose duty it should be to supervise the life assurance companies, and to secure the strict observation of the proposed law. It will be called "Bureau for Life Assurance", and should consist of five paid members, appointed by the Queen, and assisted by an officer, styled manager. None of these six officials should be connected with any company. Every company would send in to the said committee the documents required on its establishment

(enumerated above), and in case of any alteration of the deed of settlement, a copy of the same; further, a copy of its conditions of assurance and tables of premiums, and of any alteration therein; and a statement of the tables of mortality, the rate of interest, the net premiums used in the valuation and the loading; also within seven months of the end of each year, three copies of the revenue account, the balance sheet, and the yearly report, signed by the managers and the actuary. Every information required by this committee would have to be given by the company, and all registers or books would always be at its disposal.

The manager of the Bureau would prepare every year a general report upon the business and the situation of all the companies; but no opinion would be given upon any company; this report would be published, and sold to the public at cost price.

The committee would have the right to draw the attention of a company to any objections it might have against the basis on which its operations were founded, or against the management or the way in which the business was transacted. Should the company not conform to the observations of the committee, the latter would apply to the court of justice, with the request to order an investigation to be made into the situation of the company. Should this request be granted, the investigation would be held by the committee, assisted, if need be, by one or more experts. In such investigation the committee would have the right to question the managers, trustees, officers, and clerks of the company concerned, and to examine all the books, documents, &c., without any exception. After the conclusion of the investigation, the committee would communicate the result to the company, and prescribe, if necessary, the measures to be taken in order to improve its situation, and the date at which these measures must be put in force. Should the investigation show that the suspicions of the committee were unfounded, the costs would be paid by the State; otherwise the company would have to pay them. Should the committee be of opinion that the situation of a company necessitated immediate liquidation it would apply to the court of justice for the requisite order.

Several directions are given relating to the course to be followed in case of forced liquidation.

D. Concerning Amalgamation and Liquidation.

A company (not being a mutual one) wishing to transfer its business to another company, would have to apply to the committee, and hand in the last balance sheets of the two companies concerned, with a valuation report of each. The committee would intimate to both the companies whether it approved the amalgamation or not. If not, the arrangement could not be carried out. In the case of a mutual company the approval of at least three-fourths of the members would also be required before amalgamation could be carried out.

Liquidation of a company could not take place before approval of the draft scheme by the committee.

E. Concerning Foreign Companies having Agencies in Holland.

No foreign company would be authorized to transact business in Holland if not legally established in its native country, nor without

appointing a responsible representative in Holland; both to the satisfaction of the committee.

The representative of a foreign company would have the power to transact its business, and to sue and be sued on its behalf. He would be personally responsible for the fulfilment of the law, as far as it concerns his company. Change of representation would have to be notified to the committee, who would keep a register of foreign companies transacting business in Holland.

The main requirements regarding Dutch companies would be applicable to foreign ones; the reserves for Dutch assurances would be invested in Dutch real estate, or mortgages, or in bonds, to be deposited with the Bank of Holland. These assets would be hypothecated against the liabilities resulting from assurances effected in Holland. Every year the representative of a foreign company would send to the committee a valuation report on the policies in force in Holland, and a summary of the properties in Holland, belonging to the company.

In the case of the committee having any doubt as to the position of a foreign company, the same course would be followed as in the case of a native one. Should the committee not be satisfied with the position of a foreign company, it would petition the court for an order that the company should cease its operations in the kingdom; the representative would also be personally responsible for the due fulfilment of this order.

The draft contains separate directions concerning industrial assurances, which it is needless to reproduce here; further, it also lays down penalties, consisting of fines and imprisonment.

The publication of this report caused a real sensation in life assurance circles.

The first thing that struck every impartial observer was that the claims of an independent, a free business, were entirely lost sight of. The main question that seemed to have absorbed the attention of the authors was, NOT how to promote the sound growth, the healthy existence, the profitable conduct of the business of life assurance companies, but solely how to protect the insuring public against improper conduct on the part of these institutions. This was the more remarkable because it was entirely unwarranted, no Dutch life company having ever given the slightest reason for complaint. Although entirely free in their organization, in their business, no Dutch company ever failed in the most scrupulous observation of its duties; none of them ever failed to fulfil their obligations; not one of them ever departed from the most sound principles; nor did they ever do anything contrary to the requirements of the most prudent management.

The authors, it was clear, were mainly guided by a strong prepossession against the commercial element of life business; they thought of it solely as a trust.

The composition of the committee itself explained this otherwise unaccountable fact. Not a single real business man was included in it; the only member who was at the head of an office shared the above prejudice, and the other members had never taken part in the management of a company of which they had only theoretical knowledge.

A slight exception must be made in the case of one member, who,

as a trustee, had had the opportunity of becoming acquainted with real business.

And it is satisfactory to be able to state that this member differed so much from his colleagues on some principal points, that he found himself compelled to add a separate note as an appendix to the report, in which he set forth his divergent views, and explained the course which he thought should be followed.

After having stated that he was in a minority on many points of less importance, he criticized with the utmost energy the arbitrary and autocratic power proposed to be conferred on the "Bureau for Life Assurance." No company would be safe against the interference of this official body, and any company being asked by it for further information, would, by this mere fact, become discredited. The remedy should prove to be worse than the (imaginary) evil.

The functions of a bureau of life assurance must be confined to collecting and publishing the balance sheets and other accounts of the companies, prepared in prescribed form, and to acting as a consulting body when invited so to do by any company.

Moreover this member strongly objected to giving the assured a right to a surrender-value or a paid-up policy. The premium-reserve being the exclusive property of the company, the law should not prescribe that it should, under any circumstances, be given away as a right to others, not even to the assured.

By these declarations of a member of the Royal Commission itself, the importance of the report was largely diminished.

But it was only the beginning of the struggle against despotic tendencies. The managers of different companies, the assurance press, and other newspapers, were unanimous in condemning the principles on which the whole system was built up, and it is a great delight to be able to state *that not a single voice was raised in its favour.*

Perhaps the Government Actuary was the only one who appeared not entirely opposed to the committee's proposals, but he is an official, and not in the profession.

The Life Managers' Association had a paper read to them on the subject by one of the members, and unanimously resolved, at a meeting at which two-thirds of the members were present, and after thorough discussion:

(*a*) That the draft Bill presented to Her Majesty the Queen Regent, by the commission, ought to be rejected, on account of its general tendencies.

(*b*) That any separate "Bureau for Life Assurance", organized and working as proposed by the commission, is against the interests of the assured, as well as those of the assurers.

(*c*) That it is desirable that every requirement to be laid on life assurance companies should be defined by law.

And in a second meeting they adopted, also *unanimously,* the following resolution:

(*d*) That the basis of a future legislation can be no other than that of freedom and publicity.

They decided, moreover, that a committee should be formed of

the members of the Association, in order to prepare a draft Bill, based on the main principles now laid down by them, and to be, after discussion and adoption by the Association, respectfully presented to Her Majesty's Government, as the opinion of the members of the profession.

The Association of Mathematical Advisers of Life Assurance Companies also devoted a meeting to the discussion of the Royal Commissioners' Draft Bill, and, although the passing of resolutions has been deferred until the June meeting, it can be stated that also in this Association there is a strong general feeling against the main principles on which the draft Bill is drawn up.

It is obvious, from all that precedes, that a Life Assurance Companies Act is wanted, and that the companies themselves have been the first to claim it. It is further proved that the Government has taken the matter in hand, but that, unfortunately, the two attempts they made to prepare a useful regulation both failed; the first on account of the different opinions of the men in whose hands the preparation of the matter was put, the second on account of the autocracy and insufficiency of the proposed scheme.

The Dutch people have an inborn hatred against the government of functionaries. It is proud; it is jealous of its freedom; it considers everything that should try to deprive it of this most holy right as a mortal enemy.

The endeavour to place that freedom under the control of outsiders must, therefore, necessarily fail. Such a policy is not in accordance with our morals, but directly against them.

Other continental countries have tried to regulate life assurance in such a paternal way; to prescribe everything, and to give a formula for every action, without remembering two things, namely, (1) that the State accepts, in consequence, a responsibility which it ought not to have and cannot entertain; and (2) that it invalidates, by means of such autocratic prescriptions, every real progress, every intense development of the business. These States have usurped to themselves the right of interfering with business which is not theirs, and this merely by virtue of their superior strength. But there is no moral ground, no basis of higher order, to account for such a policy; it is seditious and censurable to the highest degree. It transforms the companies into State institutions, and the managers and directors into marionettes or State officials, which seems still worse. It is as a blame laid on the present state of civilization, for it seems to indicate that the people have to be governed like children, and to be protected against everything, because they are too weak or too stupid to look after their own interests.

It seems to me that the draft of the Bill has borrowed its general principles from such continental legislations. It is, indeed, a political conviction of many men at the present time, that the part which the State has to take, consists in embracing and controlling everything, without leaving anything to personal and individual efforts. Such political convictions also exist in Holland, but principally amongst those who stand far from daily business life, and are closely connected with the State.

But, happily, this opinion is not shared by the larger part of the population, who have to work for their own existence, who live by

their own enterprise, and are so much the happier, as they have but little connection with the State.

And this is also the case with life assurance business. All that is wanted is a legislation based on the tried principles of the English scheme. Freedom and publicity; that is the only resource for the steady, solid, and prudent development of this line of business. Freedom to arrange matters to the convenience of both assurer and assured; freedom in establishing premium tables, policy conditions, valuation, and everything; perfect freedom, but counterbalanced, completed, refined by publicity of the results arrived at, both financially and technically; publicity in a form prescribed by law and bearing upon the essential items.

This freedom and this publicity combined, will secure to the business the largest extension that can reasonably be expected, and to the public the most profitable terms, together with the greatest safety. By this system the latter will be in a position to judge for itself, to make its own selection, to have no doubt about the exact position of any company, and the companies will be protected against any attack on their liberty, which is the vital power of every enterprise.

A nation that does not scrupulously take care of the entire and undivided preservation of this precious good, commits suicide.

De la Législation Russe en Matière d'Assurance sur la Vie.

Par M. OSTROGRADSKY.

Les lois sur l'assurance présentent généralement deux parties suffisamment distinctes. Les unes traitent des conditions spéciales de l'organisation des sociétés d'assurance et de leurs rapports avec l'état et forment ce qu'on peut nommer le droit public de l'assurance. Les autres concernent le contrat d'assurance et en forment le droit privé. Ce sont ces deux côtés de la question qu'il convient d'étudier pour se faire une idée complète de la législation d'un pays sur l'assurance.

I.

Les sociétés d'assurance sur la vie en Russie sont anonymes (sociétés par actions). Comme telles, leurs statuts sont soumis à la sanction Impériale, sur un arrêté du Comité des Ministres (Code des Lois, t. x., Lois Civiles, arts. 2,196 et 2197.)[1] Les conditions générales des polices sont soumises à l'approbation du Ministre de l'Intérieur. Il n'est pas défendu aux sociétés de réunir plusieurs branches d'assurance ; mais chacune de ces branches doit être garantie par un capital social d'au moins 500,000 roubles. Tant que les capitaux de réserve (non compris la réserve des primes) n'atteignent pas le tiers du capital social, la dividende aux actionnaires ne doit pas excéder 7% ; de même avant amortissement complet des frais d'organisation de la société la dividende ne peut excéder 6% (loi du $\frac{6}{18}$ juin 1894 sur la surveillance des établissements et sociétés d'assurance, "Bulletin des Lois," année 1894, No. 98 ; Introduction, art. VII.).[2] Les frais d'organisation ne doivent pas entamer plus d'un dixième du capital social ; ils sont à amortir dans l'espace de dix ans (loi citée du 6 juin 1894, art. 16). Les sociétés d'assurance sur la vie ont à déposer annuellement une réserve des primes, calculée d'après les règles qui leur seraient imposées (loi cit. art. 17).

Les sociétés d'assurance sont soumises à la surveillance du Ministère de l'Intérieur. Les conditions de cette surveillance, reglées par la loi du 6 juin 1894 précitée, se résument à ce qui suit.

[1] Le cas de fondation d'une société d'assurance mutuelle sur la vie n'est pas prévu par la loi russe. S'il se présentait, il est à supposer que le même mode d'action lui serait appliqué.

[2] Il est spécifié dans l'article VII. cité que les clauses de cet article ne concernent que les sociétés fondées après l'édition de la loi de 1894. En pratique la règle concernant la dimension du capital social avait été suivi avant 1894, de sorte que les anciennes sociétés n'y dérogent pas.

Il est fondé au Ministère de l'Intérieur un comité de quatre membres (dont deux représentant le Ministère de l'Intérieur et les deux autres le Ministère des Finances), présidé par le directeur du Département Économique du premier de ces Ministères. Les membres absents sont supplées par des candidats. Les affaires du Comité sont gérées par un bureau spécial, nommé Section d'Assurances (arts. 1–3 et 9). Les arrêtés du Comité entrent en force s'ils sont sanctionnés par le Ministre de l'Intérieur, qui pour quelques questions importantes, s'accorde préalablement avec le Ministre des Finances (loi cit. art 12). Le Comité d'Assurances est chargé de la surveillance des sociétés d'assurance par rapport à la concordance de leurs actes avec les lois et les statuts des sociétés et à l'intégrité de leurs capitaux; il possède le droit de révision (art. 11, §§ 1–4). La loi ne précise pas les droits du Comité en cas de dérogation des sociétés aux lois existantes, hormis le cas spécial d'épuisement du fond social (v. plus bas); mais il résulte du sens général des lois russes, qu'en cas d'urgence le Ministère de l'Intérieur a toujours le droit de référer au Comité des Ministres, investi de droits exceptionnels en matière administrative.[1] D'autre part il est évident que le Comité n'est pas compétent à traiter les affaires litigieuses qui sont du ressort de la justice. Le Comité élabore les projets de lois et de mesures administratives générales concernant l'assurance; les projets de statuts des sociétés et leurs règles de polices sont soumis à son approbation préalable. Le Comité statue sur le choix des tables de mortalité, le taux d'intérêt technique et les formules servant au calcul des réserves de primes d'assurance sur la vie, et sur les modèles de comptes rendus financiers et statistiques des sociétés d'assurance en général (art. 11, §§ 5, 10, 11, 13–15). Le Comité peut exiger des sociétés la mise en disponibilité des agents d'assurance, convaincu d'agissements réprouvables (art. 13).

Les sociétés sont tenues de présenter annuellement au Comité leur compte rendu financier et des données statistiques et de lui notifier le personnel de leurs agences (arts. 16 et 18). Elles sont sujettes à payer une légère taxe destinée à couvrir les frais de surveillance et dont le montant est révisable tous les trois ans.[2]

Le Comité use à volonté du droit de révision, dont il charge ses membres et les fonctionnaires de la Section d'Assurance. La révision porte d'abord sur l'intégrité des réserves des primes et des fonds sociaux; si ceux-là ne sont pas couverts par des valeurs effectives (immeubles, fonds, prêts et avances sur gages ou sur polices), le réviseur a le droit d'examiner le grand livre et les compter débiteurs de la société (arts. 20–22). S'il advient que 40 % du capital social[3] ont été épuisés, le Comité exige que le capital soit complété, et si cet ordre n'est pas éxécuté dans les délais prescrits par la loi, statue sur la liquidation de la société (loi cit. arts. 20–23). En ce dernier cas, de même qu'en cas de faillite, la liquidation des sociétés d'assurance est soumise à une surveillance spéciale de la part du Comité (arts. 24–36).[4]

En éxécution des dispositions de la loi de 1894 il a été statué par

[1] Les arrêtés du Comite du Ministre sont soumis à la sanction du Souverain.

[2] Cette taxe est actuellement de $\frac{1}{4}$% des primes sur la vie et de $\frac{1}{10}$% des primes pour les autres branches d'assurance.

[3] Ou tout autre part qui serait indiquée à cet effet dans les statuts de la société.

[4] On n'a tenu compte dans cet aperçu des fonctions du Comité que de celles qui ont quelque rapport à l'assurance sur la vie.

le Comité qu'à partir d'une certaine époque [1] les réserves des primes d'assurances sur la vie nouvellement contractées seraient calculées au taux de 4 % et sur la base de la table de mortalité des 23 Sociétés allemandes MI pour les assurances en cas de décès et de la table du Dr. Semmler pour les assurances en cas de vie. Un modèle très complet de comptes rendus annuels des sociétés d'assurance a été élaboré par le Comité. Enfin un projet de loi, réglant généralement les modes et conditions de placement des capitaux de ces mêmes sociétés a été présenté au Conseil d'État.

Les sociétés étrangères pour obtenir une concession en Russie, sont tenues de déposer à la Banque d'État un fond de garantie de 500,000 r. (loi du $\frac{9}{21}$ novembre 1871, "Bulletin des Lois," année 1871, No. 107). Les concessions existantes exigent encore le dépôt à la Banque de la réserve des primes d'assurances contractées en Russie, ainsi que celui d'un fond de réserve pris sur les bénéfices réalisés par la société dans ce même pays. L'acquisition d'immeubles dont la valeur est destinée à couvrir une partie de la réserve des primes a été accordée à une des sociétés étrangères sur sa demande.

II.

Le droit privé d'assurance en Russie est pour ainsi dire en voie de formation. La législation est presque nulle dans ce domaine. L'article 2,199 des Lois Civiles (t. x. du Code des Lois) donne une définition du contrat d'assurance parfaitement insuffisante et ne s'accordant pas avec l'idée de l'assurance sur la vie.[2] Cet article excepté, les Lois Civiles ne s'occupent plus que du contrat d'assurance maritime. Il faudrait donc pour étudier les conditions du contrat d'assurance en Russie se rapporter aux statuts des sociétés dont les plus anciens contiennent quelques règles de polices, ou bien à ces règles mêmes. Mais ces dernières étant sanctionné par voie administrative n'équivalent pas à des lois [3] et sont loin d'être uniformes pour les différentes sociétés. Pour subvenir à ce dernier inconvénient et satisfaire aux éxigences modernes de l'assurance le Comité des Assurances a décidé de réformer les conditions générales des polices des sociétés d'assurance et de les remplacer par de nouvelles conditions normales, dont le projet est en ce moment éxaminé par les sociétés intéréssées.

Une loi du 25 mars 1894 ("Bulletin des Lois," année 1894, No. 70) défend les contrats de tontines ou semi-tontines et statue que les assurances avec participation aux bénéfices seraient stipulées à condition de répartir ces bénéfices annuellement, sauf un délai de trois ans à partir de la conclusion de l'assurance.

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[1] 1er Janvier 1897 pour le taux d'intérêt et 1er Janvier 1898 pour les tables de mortalité.

[2] Voici cet article: Art. 2,199. L'assurance est un contrat en vertu duquel une société formée pour garantir les accidents ou bien une personne assure un vaisseau, des marchandises, une maison, ou tout autre bien meuble ou immeuble à raison d'une prime convenue ou payement, et s'oblige à rémunérer la perte, dommage ou dégât qui pourrait résulter du péril prévu.

[3] Cependant le Sénat de Cassation a fréquemment jugé, que les conditions de polices étant approuvées par le Ministre de l'Intérieur en vertu d'un droit conféré au Ministre par la loi, ces conditions devaient être considérées comme ordonnances obligatoires pour les parties et non comme clauses de contrats.

Translation.

On Life Assurance Legislation in Russia.

By M. Ostrogradsky.

Laws on the subject of assurance are generally of two quite distinct categories. The one set deals with the special conditions of the organization of assurance societies, and their relation to the State, and forms what may be called the public law of assurance. The other deals with the assurance contract, and forms the private law. It is these two sides of the question which must be studied in order to acquire a complete idea of the assurance legislation of a country.

I.

Life assurance companies in Russia are joint stock (proprietary) companies. As such, their articles of association are subject to Imperial authorization, in accordance with a decree of the Council of Ministers (Law Code, t.x., Civil Laws, Arts. 2196 and 2197).* The general conditions of the policies are submitted for the approval of the Minister of the Interior. It is not forbidden to the societies to combine several branches of assurance, but each branch must be guaranteed by a share capital of at least 500,000 roubles. As long as the reserve funds (excluding the premium reserve) do not amount to one-third of the share capital, the dividend to the shareholders must not exceed 7 per-cent. Similarly, before the complete writing-off of the preliminary and establishment expenses of the society, the dividend must not exceed 6 per-cent. (Law of 6-18 June 1894, on the supervision of assurance institutions and societies. *Law Journal*, year 1894, No. 98; Introduction, Art. vii.).† The establishment expenses must not absorb more than one-tenth of the share capital; they must be written off within ten years (Law referred to of 6 June 1894, Art. 16). Life assurance societies must deposit yearly a premium reserve, calculated according to such rules as may be framed for them (*ibid.* Art. 17.)

Assurance societies are under the supervision of the Minister of the Interior. The conditions of this supervision, regulated by the law of 6 June 1894, above mentioned, are summarized in the following paragraphs.

There is constituted at the Home Office a committee of four members (two representing the Minister of the Interior and two the Minister of Finance), presided over by the Chief of the Department of

* The case of the establishment of a mutual life assurance company is not provided for under Russian law. If it should arise it is to be anticipated that the same course of procedure would be applied to it.

† It is laid down in Article VII above referred to, that the provisions of that article only apply to companies established after the passing of the law of 1894. In practice, the rule regarding the amount of share capital had been followed previous to 1894, so that the old societies do not fail to comply with it.

Economics of the first of these Ministers. Absent members are represented by substitutes. The business of the committee is managed by a special office called Assurance Department (Arts. 1-3 and 9). The decisions of the committee come into force if they are approved by the Minister of the Interior, who, in some important questions, consults beforehand with the Minister of Finance (Art. 12). The Committee on Assurance is charged with the supervision of assurance companies, in respect of their compliance with the laws and with their articles of association, and in respect of the integrity of their capital. It possesses the right of revision (Art. 11, 1-4). The law does not formulate the rights of the committee in case of the non-compliance of the societies with the existing laws, except in the special case of the dissipation of the share capital (*vide infra*), but it results from the general sense of Russian law that in case of urgency, the Minister of the Interior has always the right of reference to the Council of Ministers endowed with exceptional powers in matters of administration.* On the other hand, it is clear that the committee is not competent to deal with matters of litigation which are in the province of the judiciary. The committee elaborates proposed laws and general administrative measures concerning assurance. Draft articles of association of societies and their policy conditions are submitted for its preliminary approval. The committee decides upon the selection of mortality tables, the valuation rate of interest, and the formulæ for the calculation of premium reserves in life assurance, and on the schedules for accounts and statements of assurance companies in general (Arts. 11, 5, 10, 11, 13-15). The committee can demand from societies the dismissal of assurance agents convicted of objectionable practices (Art 13).

The companies are bound to file annually with the committee their financial accounts and certain statistical particulars, and to supply a list of the names of their agents. (Arts. 16 and 18.) They are subject to a small tax, intended to provide for the cost of supervision, and of which the amount may be revised every three years.†

The committee avails itself at its pleasure of the right of investigation, which it entrusts to its members and to the officials of the Assurance Department. The investigation is, first of all, directed towards the integrity of the premium reserves and the corporate funds. If these are not fully represented by effective securities (real property, investments, loans and advances on mortgage or on policies), the investigator has the right to examine the ledger, and to enter debits against the society. (Art. 20-22). If it should happen that 40 per-cent of the share capital‡ has been exhausted, the committee insists that the capital shall be replaced, and if this requirement be not carried out within the time prescribed by law, it orders the winding-up of the society. (Arts. 20-23). In such case, as well as in the case of bankruptcy, liquidation is carried out under the special supervision of the committee. Arts. 24-36).§

* The decisions of the Council of Ministers are subject to the approval of the Sovereign

† This tax is at present one-quarter per-cent of the life premiums, and one-tenth per-cent of the premiums for other descriptions of assurance.

‡ Or such other proportion as may be prescribed in the constitution of the society.

§ Account has been taken, in this brief summary, only of those duties of the committee which have some reference to life assurance.

In compliance with the requirements of the law of 1894, the committee has ordered that, as from a fixed date,* the premium reserves for life assurances newly effected shall be computed at 4 per-cent interest by the mortality table of the 23 German Companies MI for life assurances, and by Dr. Semmler's table for endowments. Very complete forms of annual accounts for assurance companies have been prepared by the committee. Lastly, a draft law to regulate generally the modes and conditions of the investment of the funds of these same societies has been submitted to the Council of State.

Foreign companies in order to obtain a concession in Russia, are bound to deposit with the State Bank, a guarantee fund of 500,000 roubles (law of 9/21 November 1871, *Law Journal*, year 1871). Existing concessions require as well, the deposit with the Bank of the premium reserve for policies issued in Russia, as well as of a reserve fund derived from the profits of the Society realized in that country. The acquisition of real property, the value of which is intended to cover a part of the premium reserve, has been permitted to one foreign company at its own request.

II.

Private assurance law is, so to speak, in process of formation in Russia. There, legislation is almost non-existent. Article 2199, of the Civil Code (t. x. of the Law Code) gives a definition of the assurance contract quite inadequate, and not at all in accordance with the idea of life assurance.† Except for this article, the Civil Law concerns itself only with the contract of marine insurance. In order, therefore, to study the conditions of the assurance contract in Russia, it would be necessary to refer back to the articles of association of the companies, the older of which contain rules relating to policies, or even to these rules themselves. But these, being authorized by administrative means, are not equivalent to laws, ‡ and are far from being uniform for the various companies. To remove this last inconvenience, and meet the modern requirements of assurance, the Committee of Assurance has decided to revise the general policy conditions of assurance companies, and to replace them by new normal conditions, the draft of which is at the moment under consideration by the companies concerned.

A law of 25 March 1894 (*Law Journal*, year 1894, No. 70) forbids tontine or semi-tontine contracts, and enacts that assurances with participation in profits shall provide for an annual distribution of profits, except that there may be an interval of three years from the date of the policy.

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* January 1, 1897, for the rate of interest, and January 1, 1898, for the tables of mortality.

† This article is as follows: Art. 2199.—Assurance is a contract in virtue of which a society established to insure against accidents, or a person assures a ship, goods, a house, or any other property personal or real, in consideration of an agreed premium or payment, and undertakes to indemnify against the loss, depreciation, or damage, which may arise from the risk insured against.

‡ Nevertheless the Court of Cassation has frequently given judgment that the policy conditions having been approved by the Minister of Interior under a power conferred on the Minister by law, they must be considered as ordinances binding on the parties, and not as clauses in a contract.

Législation commerciale des assurances sur la vie en Espagne par le Docteur J. Maluquer y Salvador.

Le principe général sur cette matière est exprimé dans l'article 385 du Code de commerce en vigueur, dont le texte est ainsi conçu:—le contrat d'assurances se régira par les pactes licites consignés dans chaque police, et, à leur défaut, par les règles comprises dans le Code (titre VIII du Livre premier des Contrats d'Assurances).

Cette grande liberté d'action est le principe sur lequel fut basé, en Espagne, le droit des assurances longtemps avant le promulgation du dit Code, qui est un des plus vantés de ce pays-ci. La Cour de Cassation avait déjà proclamé cette règle en 1864, en 1871, en 1884 et à plusieurs autres dates intermediaires.

Je me borne a indiquer quelques préceptes du droit espagnol (loi et jurisprudence), sur des matiéres qui ont été l'objet de solutions diverses, soit dans l'ordre scientifique, soit dans l'ordre pratique.

Les délégués locaux sont-ils de véritables représentants de leurs Compagnie d'assurances? La réponse affirmative est soutenue dans le domaine de la théorie par le savant Professeur italien, M. Vivante; mais, dans la pratique, en Espagne, en l'absence de règle légale, il y a la declaration de la Cour de Cassation que les Sociétés d'assurances ne peuvent être assignées aux lieux ou le contrat a été passé, bien qu'elles y aient un délégué pour leur procurer des opérations d'assurances et pour percevoir des primes (Sentence 13 Mai 1861).

Risques exceptés, sauf s'il y a un pacte contraire et avec le payement d'une prime extra: 1°—en cas de décès dans des voyages hors d'Europe: 2°—en cas de mort survenue pendant le service dans l'armée ou dans la marine en temps de paix, et 3°—en cas de décès pour avoir pris part à un acte hasardeux ou extraordinaire quelconque (art. 424).

Le risque de mort ne comprend pas: 1°—le duel: 2°—le suicide, et 3°—la condamnation à mort (art. 423).

Le Professeur italien déjà mentionné, comparant ce dernier article avec celui que je viens de consigner, dit que ces exceptions sont des questions d'ordre public, et par conséquent inéluctables, pour le legislateur espagnol, parce que celui-ci n'admet dans l'article 423 aucun pacte contraire. C'est une véritable tendance vers la-dite théorie, qui à été proclamée récemment par la jurisprudence d'une des nations où les Compagnies d'assurances ont admis largement le risque du suicide. Je crois, cependant, que l'interprétation litterale du Code espagnol, est comme il suit: 1°—les conditions du contrat sont les lois

qui régissent l'assurance; 2°—à leur défaut, les préceptes du Code sont appliqués et, *dans ce cas*, le risque de mort ne comprend aucune des causes indiquées dans l'article 423; et celles de l'article 424 y sont comprises seulement quand elles ont été mentionnées dans la police.

Le contrat devient nul par suite de la mauvaise foi prouvée d'une des parties contractantes, ou par les déclarations erronées de l'assuré, fussent elles de bonne foi, si elles avaient pu avoir de l'importance pour l'estimation du risque.

La cesion des droits du bénéficiaire du contrat d'assurances doit être consignée dans la police et communiquée à la Compagnie par le cédant et par le cessionnaire. Le Code n'exige pas la remise de la police au cessionnaire pour la validité de l'acte.

Le capital assuré appartient de droit au patrimoine du bénéficiaire et la Compagnie doit le payer à celui-ci à l'epoque pactée dans la police, quand bien même il y aurait des réclamations de la part des héritiers et des creanciers de l'assuré (art. 428). Le principe de Jure Proprio des bénéficiaires est, donc, accepté. Il a été admis dans le droit contemporain à la suite d'une préparation laborieuse de travaux scientifiques et législatifs, et il convient de le mettre à l'abri des invasions d'autres lois, ainsi que de la négligence des assurés (1).

Les Compagnies espagnoles au commencement de leurs opérations formulerent plus de restrictions que le Code dans les conditions des polices; mais l'importante Société d'assurances sur la vie que j'ai l'honneur de représenter au Congrès outrepasse actuellement les régles du Code sur plusieurs points. Néamoins, je ne crois pas opportun de confirmer prolixement cette tendance en faveur de l'indiscutabilité des polices, pas plus que la tendance vers d'autres progrès.

(1).—Dans un article modeste qui a été publié par la Revista General de Legislacion y Jurisprudencia de Madrid (Mars et Avril 1897), j'ai appelé sur ce sujet l'attention des assurés espagnols pour qu'a la clause "à mes héritiers," ils préferassent, toutes les fois qu'ils le pourraient, la désignation du bénéficiaire faite nominalement ou bien indiquée par les phrases "à mon épouse," "à mes enfants," &c. C'est-à-dire, que les associés ne doivent pas renoncer aux privilèges du Jure Proprio du bénéficiaire, pour le soumettre aux lois générales du Jure Hereditario.

Translation.

On Commercial Legislation regarding Life Assurance in Spain.
By Dr. J. Maluquer y Salvador.

The general principle on this subject is contained in Art. 385 of the existing Commercial Code, the wording of which is as follows: "The "assurance contract shall be governed by the lawful agreements "embodied in each policy, and, failing such, by the rules contained "in the Code" (Heading VIII of Book I of "Des Contrats d'Assurances").

This great liberty of action is the principle on which was based, in Spain, the law of assurance, long before the promulgation of the said Code, which is one of the most praised of this country. The Court of Cassation had already proclaimed this rule in 1864, in 1871, in 1884, and at several other intermediate dates.

I confine myself to point out a few regulations of the Spanish law (law and jurisprudence) on subjects which have given rise to various decisions, either on the scientific side or on the practical side.

Are the local agents real representatives of their assurance companies? The affirmative contention is sustained, on the theoretical side, by the learned Italian professor, M. Vivante; but in practice, in Spain, in the absence of any legal rule, there is the declaration of the Court of Cassation to the effect that assurance companies cannot be proceeded against in the place where the contract has been entered into, although they have there an agent entrusted with obtaining assurance business for them and collecting premiums (Judgment of 13 May 1861).

Excluded risks, unless there is an agreement to the contrary and an additional premium is paid are: 1°, In case of death during travel beyond Europe; 2°, In case of death happening during service in the army or navy in time of peace; and 3°, In case of death owing to having taken part in any hazardous or extraordinary action whatsoever (Art. 424).

The death risk does not include: 1°, Duel; 2°, Suicide; and 3°, Sentence of death (Art. 423).

The Italian professor already mentioned, comparing this last article with the one quoted above, says that these exceptions relate to matters of public morality, and consequently cannot be deleted by the Spanish legislator, seeing that the latter does not admit in Art. 423 any agreement to the contrary. This shows a real tendency towards the theory in question, which was recently proclaimed by the judicature of one of the countries whose assurance companies have largely admitted the risk of suicide. I believe, however, that

the literal interpretation of the Spanish Code is as follows: 1°, The conditions of the policy are the laws governing the assurance; 2°, In their absence the rules of the Code are applied and, *in this case,* the death risk includes none of the causes mentioned in Art. 423; and those of Art. 424 are included only when they are specified in the policy.

The contract becomes void in the event of bad faith being proved against one of the contracting parties, or in the event of erroneous declarations by the assured, even if made in good faith, if they prove to have been material in estimating the risk.

The assignment of the rights of the beneficiary of the assurance must be embodied in the policy and notified to the company by the assignor and by the assignee. The Code does not require that the policy should be handed to the assignee to render the transaction valid.

The sum assured belongs by right to the estate of the beneficiary and the company must pay it to the latter at the time specified in the policy, even if there should be any claims on the part of the heirs and creditors of the assured (Art. 428). The principle of *jure proprio* of the beneficiaries is, hence, admitted. It has been admitted in modern law after a laborious study of scientific and legislative works, and it is important that it should be protected against the inroads of other laws, as well as against the carelessness of the assured.*

Spanish companies at the beginning of their operations included more restrictions in their policy conditions than those mentioned in the Code. But the great life assurance institution which I have the honour to represent at the Congress actually goes beyond the rules of the Code in various matters. Nevertheless, it does not seem to me to be opportune to dilate upon this tendency towards the indisputability of policies, any more than upon tendencies in other directions of progress.

* In a short article published by the *Revista general de Legislacion y Jurisprudencia* of Madrid (March and April 1897), I called the attention of the Spanish assured to the subject, in order that in lieu of the clause "to my heirs," they should prefer, at all times they could, that the beneficiary be specified by name or clearly defined by such phrases as "to my wife", "to my children", &c. In other words, that the assured should not give up the privileges of *jure proprio* of the beneficiary in order to be subject to the general laws of *jure hereditario.*

Législation des Assurances sur la vie, en Suisse. Par le Dr. Ceresole, *Secrétaire du Bureau Fédéral des Assurances, à Berne, délégué au Congrès par le Conseil Fédéral Suisse.*

En déléguant à votre Congrès M. le Dr. Moser et celui qui a l'honneur de vous parler, le haut Conseil fédéral suisse voulait avant tout donner, à ceux qu'il envoyait ici l'occasion de s'instruire sur bien des questions actuelles et délicates, et de faire la connaissance personnelle de tant d'hommes illustrés par leurs travaux.

La question qui nous occupe aujourd'hui est double; elle comporte l'examen de la législation: 1° quant au *droit commercial* (et éventuellement encore au *droit public administratif*) régissant la *constitution et le fonctionnement des sociétés d'assurance-vie*: et 2° quant au *dispositions de droit privé réglant le contrat d'assurance sur la vie.*

I.

Comme toutes les autres sociétés, celles d'assurances sont soumises en Suisse aux dispositions du code fédéral des obligations du 14 Juin 1881; il n'y a donc, *en droit commercial*, c'est-à-dire pour la constitution, l'administration et la dissolution des sociétés d'assurance-vie, rien qui distingue ces sociétés de celles autres que d'assurance; il y a moins encore de différence entre les sociétés d'assurance-vie et les sociétés d'assurance d'autres branches.

Suivant sa nature juridique, c'est-à-dire selon qu'elle est par actions ou mutuelle, une société d'assurance-vie est donc soumise aux dispositions qui touchent les sociétés anonymes ou au contraire les associations. Je ne veux relever ici que celles de ces dispositions qui ne sont pas communes à la plupart des législations actuelles.

Les sociétés *anonymes* n'acquièrent d'existence juridique que par leur inscription au registre du commerce; cette inscription a lieu, pour *toutes* espèces de sociétés anonymes, sans autorisation préalable du Gouvernement. Il n'est pas exigé un nombre minimum d'actionnaires lors de la fondation, non plus qu'un certain nombre d'actions et un montant minimum de ces dernières; la société, par contre, ne peut être inscrite—et par conséquent n'existe juridiquement—que s'il a été effectivement versé au moins 20% du capital social. Les actionnaires, de plein droit ne sont obligés que jusqu'à concurrence du montant de leurs actions.

Les sociétés *mutuelles* doivent, pour acquérir une personnalité civile propre, être inscrites au registre du commerce comme "association" et devenir par là justiciables de la poursuite pour dettes

par voie de faillite. Il n'est pas exigé un nombre minimum d'associés lors de la fondation, non plus que l'existence d'un capital de garantie. La fortune de l'association répond seule des charges sociales.

Voilà, Messieurs, à fort grands traits, quelle est la législation suisse de droit commercial touchant les sociétés anonymes ou mutuelles d'assurance-vie, et, en général, toutes sociétés anonymes ou associations.

Si comme on vient de le voir, les sociétés d'assurances sont soumises au droit commercial commun, il n'en est pas de même au point de vue du *droit public administratif;* une loi fédérale qui date déjà du 25 Juin 1885, prévoit et organise la *surveillance* des entreprises privées en matière d'assurance. A cette surveillance, qu'exerce le Conseil fédéral assisté à cet effet par le Bureau fédéral des assurances, sont soumises toutes les sociétés—anonymes ou mutuelles—d'assurance de n'importe quelles branches. Les sociétés étrangères qui entendent opérer en Suisse sont surveillées exactement au même titre que les sociétés indigènes, et avec des obligations identiques.

La loi de 1885 institue avant tout le régime de la concession ou autorisation préalable. Une concession est accordée par le Conseil fédéral, généralement de six en six ans, en suite d'examen approfondi des bases financières, techniques et juridiques de la société dont il s'agit. J'ai à peine besoin d'observer que le Conseil fédéral ne peut faire dépendre l'octroi de la concession, de considérations d'opportunité "Bedürfnissfrage." Il n'est pas perçu de finance de concession, mais la société doit déposer un cautionement—en numéraire ou en titres garantis par un Etat—dont le montant est fixé par le Conseil fédéral (pour les sociétés-vie, 100.000 francs). On a dès l'abord renoncé à l'idée de proportionner le cautionnement au montant des réserves des polices en cours; le cautionnement, relativement faible, ne fournit donc pas une sûreté complète qu'il n'était guère possible d'exiger. Aussi est-il interdit aux sociétés de se prévaloir, dans leur publicité, du cautionnement qu'elles ont déposé.

Le système de concession demeurerait sans grande valeur s'il n'était complété par la surveillance des entreprises d'assurances durant tout le cours de leurs opérations; les sociétés ont donc à soumettre et à faire approuver par le Conseil fédéral toutes modifications à leur situation telle qu'elle se présentait lors de l'octroi de la concession (nouvelles bases techniques, modifications des statuts, tarifs, conditions d'assurances, &c.). Elles doivent aussi présenter chaque année, suivant un formulaire arrêté par le Conseil fédéral, un rapport détaillé sur l'état de leur portefeuille, de leurs réserves, &c.

Chaque société peut renoncer en tout temps à sa concession. Cette dernière est retirée "Si la situation de la société n'offre plus aux assurés la guarantie nécéssaire." Dans l'un et l'autre cas la société demeure soumise à la surveillance jusqu' à ce qu'elle ait entièrement liquidé son portefeuille Suisse.

Pour l'entretien de l'autorité de surveillance, les sociétés versent annuellement une contribution de 1 $^{0}/_{00}$ de leurs primes brutes perçues en Suisse.

Sont passibles d'une amende de 5,000 francs au maximum et d'un emprisonnement de six mois au maximum, prononcés par les tribunaux sur plainte du Conseil fédéral, les personnes qui exploitent sans concession une entreprise d'assurance, celles qui prêtent leur concours

à cette exploitation illicite (agents, bureaux de publicité, &c.), et les sociétés qui dissimulent leur situation réelle dans leurs rapports à l'autorité de surveillance ou qui publient des communications (prospectus, &c.) contraires à la vérité.

Le Conseil fédéral lui-même peut frapper d'amendes disciplinaires atteignant 1,000 francs au maximum, les sociétés d'assurance qui contreviennent aux décisions prises par lui "dans l'intérêt général ou dans celui des assurés"; je m'empresse d'ajouter que le Conseil fédéral est dans l'agréable situation de n'avoir que très rarement à user de cette compétence disciplinaire.

Antérieurement à 1885, les entreprises d'assurances étaient assujetties, de la part de beaucoup de nos cantons (ou Etats confédérés), à des impôts spéciaux souvent fort onéreux (taxes de patente, d'enregistrement des polices, &c.) en faisant passer des cantons à la Confédération la surveillance des sociétés d'assurance, la loi de 1885 a réintégré ces sociétes sous le régime fiscal de droit commun: elle dispose que les sociétés d'assurances ne pourront être astreintes de la part des cantons à des taxes, impôts ou conditions de fonctionnement spéciales. C'est-à-dire que ces sociétés ne doivent que les impôts (sur le revenu, foncier, &c.) exigés aussi, à circonstances égales, des sociétés autres que d'assurance. Les agents n'ont pas comme tels à s'inscrire au registre du commerce, ni encore moins à se munir d'une patente.

II.

Il me resterait encore à vous parler des *dispositions de droit privé touchant le contrat d'assurance sur la vie.* Mais le temps me manque à cet effet; il suffira donc d'observer qu'aujourd'hui quatre seulement de nos vingt-cinq cantons possèdent des dispositions spéciales sur le contrat d'assurance,—que ces dipositions sont fort incomplètes et souvent surannées,—et qu' à leur défaut les tribunaux appliquent les principes généraux du code fédéral des obligations. En 1893, le Conseil fédéral a chargé M. le Dr. Roelli d'élaborer un projet de loi fédérale sur le contrat d'assurance; ce projet, paru en 1896, intéresse non seulement la branche vie mais toutes les espèces d'assurances; il a été soumis au préavis des Facultés de droit des Universités suisses, des autorités judiciaires supérieures, des Gouvernements cantonnaux, de toutes les sociétés d'assurance opérant en Suisse et de la presse spéciale; on a ainsi réuni une foule d'observations fort utiles. Le projet est actuellement l'objet des délibérations d'une commission spéciale d'experts, qui lui fera probablement subir diverses modifications; c'est là un motif de plus pour ne point aborder ici l'étude du projet, que nous tenons à la disposition de ceux des membres du Congrès qui voudraient bien de s'y intéresser.

Translation.

On Legislation regarding Life Assurance in Switzerland. By Dr. Ceresole, *Secretary of the Federal Assurance Department at Berne, and Delegate to the Congress of the Swiss Federal Council.*

In delegating to your Congress Dr. Moser and him who has the honour of addressing you, the Swiss Federal Council desired above all to afford to those it sent here the occasion to enlighten themselves on many pressing and delicate questions, and to make the personal acquaintance of so many men renowned for their work.

The question which engages our attention to-day is two-fold. It involves the consideration of legislation, 1st, as to *Commercial Law* (and eventually also of *Public Administrative Law)* in so far as it governs the *establishment and working of Life Assurance Companies;* and 2nd, as to *the provisions of Private Law regulating the Life Assurance contract.*

I.

Like all other companies, assurance companies are subject in Switzerland to the provisions of the Federal Code of obligations of the 14 June 1881; there is, therefore, in the light of *Commercial Law, i.e.,* as regards the establishment, management and dissolution of life assurance companies, nothing which distinguishes these companies from any others. There is still less difference between Life assurance companies and assurance companies of other descriptions.

Pursuant to its legal character, that is to say, according as it is proprietary or mutual, a life assurance company is thus subject to the provisions affecting joint stock companies, or, on the contrary, to those affecting associations. I shall only mention here such of these provisions as are not common to the majority of existing legislations.

Joint stock companies acquire a legal status, only through their entry in the Commercial Register; this registration takes place, as regards *every* kind of joint stock company, without any preliminary authorization by the Government. It is not required that there should be a minimum number of shareholders at the time of establishment, neither that there should be a certain number of shares, and a minimum amount of the latter. On the other hand, the company cannot be registered, and consequently does not exist legally, unless at least 20 per-cent of the Capital has been effectively paid up. The shareholders, by right, are only liable up to the amount of their shares.

The *Mutual* companies must, in order to acquire a corporate personality of their own, be entered upon the Commercial Register as "associations", and become thereby liable to be sued for debt by way of bankruptcy. It is not required that there should be a minimum number of members at the time of establishment, nor that there should be any capital as security. The funds of the association alone are answerable for the companies' liabilities.

Here is, then, gentlemen, in very rough outlines, the Swiss Commercial legislation relating to joint stock or mutual life assurance companies, and generally, to all joint stock companies or associations.

If as we have just seen, assurance companies are subject to the ordinary commercial law, this is no longer the case from the point of view of *public administrative law.* A Federal law dating as far back as the 25 June 1885, provides for and regulates the *supervision* of private assurance companies. To this supervision, which is carried out by the Federal Council assisted to that end by the Federal Assurance Department, are subject all assurance companies—joint stock or mutual—whatsoever. Foreign companies desiring to transact business in Switzerland are subject to supervision exactly in the same way as native Companies, and their obligations are identical.

The law of 1885 inaugurates above all the system of concession or preliminary authorization. A concession is granted by the Federal Council, usually for successive terms of six years, after careful examination of the financial, technical and legal constitution of the company in question. I need hardly point out that the Federal Council cannot make the grant of concession dependent upon considerations of expediency. There is no concession fee levied, but the company must make a deposit—in cash or in bonds guaranteed by some State—the amount of which is fixed by the Federal Council (for life assurance companies—100,000 francs). From the outset the idea was abandoned of determining the deposit in proportion to the amount of the reserves for outstanding policies; the deposit, relatively small, does not therefore furnish full security, which it was scarcely possible to claim. The companies are therefore also prohibited to refer, in their advertisements, to the deposits effected by them.

The system of concession would be of little value if it were not completed by the supervision of the assurance institutions during the whole duration of their operations; the companies must consequently submit to and get approved by the Federal Council, all modifications in their position, such as it was when the concession was granted (new technical basis, modifications of the deeds of settlement, tables of rates, assurance conditions, &c.). They must also furnish every year, in a form prescribed by the Federal Council, a detailed report on the State of their investments, their reserves, &c.

A society may at any time surrender its concession; and the concession is withdrawn if the position of the society "no longer offers to the assured the necessary guarantee." In either case the society remains subject to supervision until it has entirely run off all its Swiss business.

Towards supporting the Office of Supervision the companies pay annually a duty of 1 per-cent on the gross premiums collected in Switzerland.

All persons are subject to a maximum fine of 5,000 francs and to six months' imprisonment at the outside, after sentence by the Courts upon the complaint of the Federal Council, who carry on without concession any assurance operations, as also all persons lending their assistance to such unlawful operations (agents, advertising offices, &c.), and all companies concealing their real position in their reports to the Office of Supervision, or publishing matters (prospectuses, &c.) contrary to truth.

The Federal Council itself may inflict disciplinary fines, not exceeding 1,000 francs, upon assurance companies contravening its decisions, which are taken "in the public interest or in the interest of the assured." I hasten to add that the Federal Council finds itself in the happy position of having but very rarely to make use of this disciplinary power.

Prior to 1885, assurance institutions were subject, on the part of many Cantons (or federated States), to special taxes, often very heavy (taxes for license, for registration of policies, &c.); in shifting from the Cantons to the Confederation the supervision of assurance companies, the law of 1885 has reinstated these companies under the fiscal system of ordinary law: it provides that assurance companies shall not be subjected by the Cantons to taxes, duties or special conditions of management; this means that these companies are only liable to the duties (on the income, real property, &c.) to which companies, other than assurance companies, are liable under similar circumstances. The agents are not obliged to have their names entered in the Register of Commerce, and still less to provide themselves with a license.

II.

It would still remain for me to mention the provisions of *private law relating to the life assurance contract*, but time fails me for the purpose. It will be enough to mention that only four out of our 25 Cantons possess special enactments relating to the assurance contract,—that these enactments are very incomplete and often obsolete,—and that failing them, the Courts apply the general principles of the Federal Code. In 1893 the Federal Council requested Dr. Roelli to draw up a Federal Bill on the assurance contract. This Bill, issued in 1896, relates not only to life assurance but to all kinds of assurance; it has been submitted to the opinion of the law faculties of the Swiss Universities, of the higher judicial authorities, of the Cantonal Governments, of all assurance companies operating in Switzerland, and of the professional press. There has been, in this way, collected a mass of very useful criticisms. The Bill is actually under consideration by a special commission of experts which will probably introduce various alterations. This is an additional reason for not entering here upon a discussion of the Bill which, however, is at the disposal of those members of the Congress who may take an interest in it.

La Législation dans ses Rapports commerciaux et économiques avec l'Assurance sur la Vie, au point de vue national et international.

Par CHARLES LE JEUNE, Anvers.

Les atteintes portées par les gouvernements au fonctionnement libre des institutions d'assurance ne se comptent plus. Les lois les plus réactionnaires, les plus injustes, et les plus inconsidérées ont été dirigées contre elles. Le patrimoine des familles, les économies accumulées par les laborieux et les patients sous la forme si sage et si morale de l'assurance, sont l'objet des mesures les plus draconiennes et des appropriations les plus hardies.

Le remarquable rapport présenté par Mr. R. Harding, Associé de l'Institut des Actuaires de Londres, au Congrès de Bruxelles de 1895, abonde en aperçus précieux et en documents intéressants sur le traitement législatif des institutions d'assurance sur la vie dans un grand nombre de pays et divers autres membres y ont ajouté des notes qui en complètent les données pour leurs pays respectifs. Pour les Etats-Unis Mr. Howell William St. John, ex-Président et Membre du Conseil de l'Actuarial Society of America, et pour le Canada, Mr. T. B. Macaulay, Membre du Conseil de la même Société, ont fourni au même Congrès de substantielles études sur un aspect spécial du sujet, celui du contrôle par l'Etat de ces institutions.

L'examen de ces travaux mène à des conclusions d'une gravité extrême. L'assurance sur la vie ne peut se développer avec succès qu'à la condition d'être mise à l'abri des caprices de législations incompatibles avec les nécessités de l'institution. Ces nécessités s'indiquent par la nature même de l'assurance. Les opérations d'assurance, par la longueur de leur durée, ne peuvent se comparer avec celles faites par la plupart des autres contrats. Elles sont une des formes importantes de l'épargne du pays, et la seule ressource de beaucoup de familles. Tout ce qui peut faire obstacle à l'accomplissement des engagements des institutions d'assurance est donc hautement préjudiciable aux intérêts les plus sacrés.

Lorsqu'une société d'assurance, après avoir été admise à fonctionner dans un pays, se voit obligée de cesser ses opérations ou de se retirer

sans raisons justifiées par l'intérêt public, on lui inflige un dommage qu a les plus facheuses conséquences pour les assurés de ce pays même, surtout s'il s'agit d'une société étrangère, par suite de la perturbation apportée aux rapports entre la société et ses assurés. Lorsque les opérations d'assurance traitées sous l'empire de méthodes scientifiques dont le coût est calculé en tenant compte de certaines prévisions et de certains alea, se voient grevées de charges disproportionnées et imprévues, ce ne sont pas seulement les relations entre assureurs et assurés qui sont entravées, c'est la sécurité des assurés que l'on met en péril. Lorsqu'enfin, sous prétexte de rendre plus certaine l'exécution des contrats conclus sur son territoire, le gouvernement d'un pays prétend affecter à leur garantie, par privilège, certains fonds d'une société d'assurance, il détruit le principe d'égalité qui est la sauvegarde des autres assurés non investis d'un semblable privilège.

Ces conclusions sont si évidentes qu'à peine était-il besoin de les exprimer. Mais comme les mesures législatives se multiplient de la façon la plus arbitraire, qu'après avoir eu d'abord pour raison et pour justification un contrôle inspiré par l'intérêt public, elles tendent à une véritable main mise sur les capitaux des institutions d'assurance, par voie d'impositions excessives, et d'appropriation de leurs fonds dans les conditions les plus léonines et les plus dangereuses, il apparaît qu'une nouvelle phase s'ouvre pour ces institutions pour l'exercice de leur industrie, dans le domaine international.

L'exemple le plus frappant d'une législation qui a poussé l'abus jusqu'à ses extrêmes limites, nous est offert par la République Argentine. Par une loi sanctionnée dans le cours de cette année, le gouvernement est autorisé à émettre un emprunt spécial de sept millions de pesos, en bons portant 5 pour cent d'intérêt, 1 pour cent d'amortissement, dont la souscription est imposée aux taux de 80 pour cent, aux institutions d'assurance étrangères, pour la garantie des opérations contractées par elles dans ce pays. En d'autres termes, c'est un emprunt forcé, dont les fonds d'assurance ont fourni le prétexte et l'application, c'est un véritable accaparement par l'Etat des deniers des sociétés d'assurance et de leurs assurés.*

Il faut bien en présence de pareils faits, s'ajoutant à tant d'autres, se demander si les institutions d'assurance peuvent continuer à étendre leur cercle d'action au dehors, sans garanties certaines pour l'avenir qui leur est réservé, et si les conditions commerciales et économiques dans lesquelles elles sont appelées à se mouvoir au delà de leurs frontières, répondent à leurs besoins et la nature de leurs opérations.

Et avant d'examiner ces points, je crois qu'il n'est pas sans intérêt de poser cette question : l'assurance sur la vie, par son caractère propre, est elle d'essence nationale ou internationale ?

En faisant un retour en arrière, il est certain qu'à son origine elle a eu un caractère national. Les premières institutions qui se sont créées, sous l'octroi de chartes ou d'autorisations, n'avaient guère d'autre objet que de chercher dans leur pays d'origine les éléments nécessaires à leur

* Après le vote de la loi et à la suite des protestations qu'elle a soulevées—entr'autres de la part du gouvernement britannique—contre la violation des traités qui en résulte, l'exécution en a été suspendue. Par une nouvelle loi, le gouvernement argentin a admis les compagnies étrangères a souscrire *volontairement* l'emprunt qui leur était imposé. Il est inutile d'ajouter qu'elles ont cédé à des nécessités, en se résignant à souscrire à cet emprunt.

activité. Ce n'est que dans la seconde partie de ce siècle, que s'est dessiné un mouvement différent, corrélatif à l'augmentation des échanges commerciaux et à l'accroissement de l'expatriation.

On peut dire en faveur de l'assurance, envisagée à un point de vue purement national, qu'elle est la plus rationelle. Les nationaux d'un même pays sont régis par les mêmes lois et l'état juridique auquel sont soumis les institutions et les contractants, concorde avec la législation uniforme qui les gouverne. Les problèmes difficiles du droit international privé, qui suivant la législation de chaque pays régit les rapports des étrangers à raison des biens qu'ils y possèdent ou des contrats qu'ils y ont passé, ne se posent pas. Les bases industrielles sont simples aussi, les lois de la mortalité, les placements des capitaux, la gestion des opérations, ont un caractère harmonique. L'argent du pays ne quitte pas le pays, comme c'est le cas pour les assurances faites auprès d'une société étrangère. On voit en effet en pareil cas la prime, ou le capital remis à cette société, s'en aller à son siège social à l'étranger pour revenir plus tard dans le pays au terme et dans les éventualités prévus par le contrat après avoir laissé dans les mains étrangères la dîme du reste très légitimement acquise, que la compagnie a pu prélever sous forme de bénéfices, ou sous forme de frais dépensés chez elle.

Mais se serait montrer un esprit rebelle aux nécessités des temps, et méconnaître des réalités qui s'imposent, que de conclure de ce qui précède que l'assurance sur la vie doit se limiter à son champ national. Il est certain que le courant si intense qui porte les nations à échanger non seulement leurs produits et leurs valeurs, mais leurs travaux intellectuels, continuera, grâce à la facilité croissante des communications, à développer l'expatriation. L'homme suit ses intérêts sur le sol étranger, et l'idée qui pousse les hommes des divers pays à échanger et à unir leurs travaux, leurs études, leurs efforts, et dont le Congrès International d'Actuaires est une preuve manifeste, porte à croire que les voies resteront largement ouvertes dans tous les pays aux institutions ayant pour but de répandre des principes de prévoyance et d'altruisme profitables à l'humanité entière.

Du reste, depuis un grand nombre d'années les faits accomplis s'imposent. De grandes institutions d'assurance ont été porter leur expérience, leurs garanties, leurs capitaux en d'autres pays que le leur, elles y ont rendu des services, elles y ont formé des contrats, elle y ont des établissements organisés, et les pays où elles se trouvent ne pourraient que perdre à leur départ. Sous prétexte de protéger des nationaux, les Etats oublient souvent les intérêts existants qui sont considérables pour beaucoup de ces nationaux, assurés par des sociétés étrangères et qui doivent les rendre très circonspects dans les mesures qu'ils prennent.

Les exigences qui se sont fait jour dans divers pays ont diverses causes. Il en est trois que je crois pouvoir signaller:

1°. Le désir d'exercer un contrôle sur les institutions d'assurance sur la vie, dans un intérêt public.

2°. L'idée de protection nationale.

3°. Les expédients financiers qui incitent les gouvernements à chercher des ressources dans les impôts et dans les appropriations des fonds d'assurance à leur portée.

De la première idée, je ne m'occuperai pas autrement que pour appuyer des idées déjà émises et entr'autres par Mr. George King,

l'éminent Vice-Président de l'Institut des Actuaires de Londres, dans sa belle étude " On Legislation affecting Life Assurance Companies " (Journal de l'Institute of Actuaries, Vol. XXIX. page 481). Liberté de fonctionnement et publicité prescrite dans des formes définies, et selon les vues exposées par Mr. King permettant à des tiers compétents, au moyen des éléments fournis par les comptes-rendus, de controler efficacement la situation des sociétés d'assurance, tels sont à mon avis les seuls desiderata à exprimer. Ils sont vrais pour tous les pays, sans qu'il y ait lieu de distinguer entre le pays d'origine et le pays étranger où la compagnie a un siège.

Quant à la protection nationale, il faut distinguer deux mobiles d'ordre différent, la protection des assurés nationaux et la protection des sociétés nationales.

Certains gouvernements préoccupés de l'issue lointaine des contrats d'assurance sur la vie et de la nécessité d'en assurer l'exécution, ont imposé diverses obligations aux compagnies étrangères qui opèrent sur leur territoire, en vue de protéger leurs nationaux assurés par elles. Parfois ils exigent des dépôts ou cautionnements qui sont destinés à fournir en quelque sorte la preuve matérielle des ressources financières dont dispose la société qui établit un siège dans un pays qui n'est pas le sien, et à servir de garantie, au moins dans une mesure relative, aux transactions qu'elle y conclut. Lorsque ce cautionnement est une somme fixe, ne comportant qu'une part raisonnable de l'actif libre de la société, cette obligation n'offre pas de graves inconvénients, quoiqu'elle soulève diverses objections parfaitement mises en lumière par Mr. Harding, dans son rapport au Congrès de Bruxelles.

Mais il n'en est pas de même lorsque le dépôt est basé sur le chiffre des primes ou capitaux encaissés, ou sur la réserve mathématique, calculée d'après les règles de la société elle-même ou d'après celles que fixent les lois de certains pays. De semblables dépôts, lorsqu'ils sont affectés par privilège, aux engagements de la société d'assurance à l'égard de ses assurés d'un pays déterminé, préjudicient de la façon la plus injuste ses assurés d'autres pays.

Et je me permets, sur ce point, de formuler quelques remarques au sujet de l'avis émis par Mr. George King, dans son étude citée plus haut. Examinant la question plus spécialement pour le Royaume-Uni, Mr. King dit (page 519) : " Je pense que toutes les sociétés, soit régnicoles, coloniales, ou étrangères, devraient être obligées de conserver, au nom de depositaires (trustees), sujets anglais et domiciliés dans le Royaume-Uni, un montant au moins égal aux engagements mathématiques existants à raison des opérations conclues par des sociétés ou agences dans le Royaume-Uni, lequel actif ne pourra être retiré du Royaume-Uni, aussi longtemps que les dites opérations resteront en vigueur." C'est là à mon avis une thèse contraire aux intérêts des institutions qui font des opérations hors de leurs pays d'origine, et contraire aux intérêts de la généralité des assurés ; il importe peu que Mr. King ait parlé pour l'Angleterre, vu qu'en cette matière il n'y a pas deux vérités. Je ne vois pas, il est vrai, dans des termes absolus, que Mr. King entend affecter par privilège aux assurés anglais le montant ainsi déposé, mais si je ne fais pas erreur, cette conclusion me paraît ressortir de ses diverses déductions.

J'estime que tout privilège, tout droit de préférence donné à un

assuré, et qui peut causer préjudice à un autre assuré, est une iniquité. Il n'est pas admissible, lorsque les charges sont supportées en commun, que certains assurés se voient garantis par un gage spécial, détourné de l'actif général, et que d'autres assurés n'aient pour garantie que le surplus non engagé. En tout cas, les assurés devraient être avertis de cette situation quand elle existe, et les sociétés qui dans leurs comptes-rendus, prospectus et réclames mentionnent les fonds de garantie qu'elles possèdent, devraient en même temps faire connaître les affectations spéciales qui privent certains assurés d'une partie de leurs garanties, au profit de certains autres. Car la position des assurés dans ce cas est la suivante : ceux qui ont des gages spéciaux ont pour garantie l'avoir total de la société en même temps qu'ils conservent un droit de préférence sur une partie de cet avoir ; ceux qui n'ont pas de gages spéciaux n'ont pour garantie que cet avoir moins la partie affectée aux assurés privilégiés. En cas d'insolvabilité certains assurés seront payés intégralement ou tout au moins avantagés, d'autres seront les victimes et ne recevront que les miettes du festin.

Je pense qu'un pareil état de choses est incompatible avec les principes de justice et d'équité qui doivent être la première loi des sociétés d'assurance sur la vie. Gardiennes de l'épargne des prévoyants, elles leur doivent la gestion du père de famille, et un père ne fait pas de distinction entre ses enfants.

A un certain point de vue, on pourrait soutenir que les sociétés qui ont un capital et des actionnaires ne peuvent être blâmées de faire des opérations sous diverses charges et conditions, selon les nécessités de leur industrie, pour autant qu'elles y soient autorisées par leurs statuts. Une société par actions poursuit assurément pour ses actionnaires un but lucratif. Ses assurés le savent. Lorsqu'elle leur accorde une participation dans ses bénéfices, elle fait un partage. Elle leur donne outre l'avantage du capital social qui indépendamment des réserves propres aux opérations garantit l'exécution des contrats, une partie des profits qu'elle réalise. Mais elle ne les associe pas à ses risques. En droit strict, elle peut leur enlever certaines garanties, ou plutôt les prendre aux uns pour les donner aux autres, mais en équité elle est condamnable de le faire.

Mon opinion est donc que les sociétés d'assurance devraient se refuser à toute appropriation de leurs fonds créant des inégalités entre leurs assurés, à moins de faire cette appropriation dans les mêmes conditions dans chaque pays où elles opèrent. Mais un système qui consisterait à affecter dans chaque pays des ressources particulières à la garantie des contrats qui s'y forment, ressemblerait beaucoup au morcellement d'une société en diverses sociétés nationales, sauf que le capital-actions, s'il n'était pas à son tour absorbé par des cautionnements locaux, resterait debout pour répondre des pertes ou différences qui pourraient être constatées en certains pays. On en arriverait sans doute par des déductions plus ou moins logiques à classer aussi les assurés par nations et à leur attribuer des comptes séparés, les privant des avantages d'une communauté nombreuse, composée d'assurés de toutes les nations.

Commercialement, le morcellement des capitaux est plein de difficultés, de dangers et de frais. Economiquement il transforme le rouage qui sert à l'échange international de capitaux et de sécurité et qui pour

beaucoup de pays imparfaitement organisés répond à un besoin, en un rouage local, dépourvu d'initiative et privé de ses meilleurs éléments de productivité.

Et ce qui est vrai pour les sociétés possédant un capital-actions, l'est bien plus encore pour celles qui n'en ont pas. A quel titre des sociétés purement mutuelles, iraient elles porter au dehors les fonds que leurs participants leur confient, et les donneraient-elles en garantie à d'autres participants plus favorisés ?

La protection des assurés nationaux par des moyens pareils ne peut avoir que des résultats funestes, et assurément lorsque les sociétés souffrent et ne peuvent exercer leur industrie dans des conditions de nature à les rémunérer, ceux qui ont contracté avec elles doivent souffrir aussi. Les fonds de garantie eux-mêmes seraient impuissants à maintenir la sûreté des relations entre les sociétés et leurs assurés ; or il y a nécessité de rapports bienveillants entre eux et d'exécution large et facile des engagements contractés.

Le second mobile de la protection nationale, celui qui a pour but de favoriser les institutions d'assurance nationales contre la concurrence étrangère, est dépendant du courant d'opinions qui prévaut en certains pays, et qui les porte à restreindre les échanges et à protéger les industries nationales, au risque de faire payer plus cher par leurs nationaux un produit moins bon. Il est inutile d'exprimer ici sur ce sujet qui se lie à la politique économique des nations, aucune idée particulière. Les conflits qui passionnent si vivement les libre-échangistes et les protectionnistes, ne me paraissent pas pouvoir entrer dans le cadre des travaux du Congrès des Actuaires. Je me bornerai donc à dire qu'à mon avis la protection en tant qu'elle a pour but de favoriser des institutions nationales d'assurance sur la vie par opposition aux institutions étrangères, fait fausse route et sera désavantageuse à la nation.

Quant à l'appropriation des capitaux d'une façon déterminée, dont la loi décrétée dans la République Argentine est un frappant exemple, il est presque surabondant d'en signaler le danger. Chaque pays naturellement en prétendant imposer des cautionnements, et des dépôts de garantie basés sur les réserves ou quelqu'autre système, prétendra en même temps imposer son crédit, sa dette publique, comme emploi obligatoire des fonds, ce qui en fait mènerait les sociétés d'assurance à perdre la gestion des fonds qui leur sont confiés. La sécurité des placements et leur bon rendement sont deux difficultés qui exigent au plus haut degré de la part des administrateurs des sociétés d'assurance, la liberté dans la sélection. En certains pays, la sécurité fait défaut et le nombre des pays qui ont cessé de faire honneur à leurs engagements devient de plus en plus grand. Dans d'autres pays on se voit exposé à l'instabilité de la monnaie légale. Là où la sécurité est le mieux assurée, le taux de l'intérêt des valeurs de l'Etat est si faible qu'il ne suffit plus à fournir aux capitaux le rendement nécessaire. Les impôts sont une autre plaie, qui draine les ressources des institutions d'assurance et qui avec l'arbitraire qui règne en certains pays peut les ruiner. Ils affectent les formes les plus variées, et même celles du droit différentiel, en vertu duquel les sociétés étrangères ont à payer des droits supérieurs à celles du pays. En principe les impôts, au moins ceux qui frappent directement les transactions, devraient rester à la charge des assurés. Une

compagnie ne se verrait pas exposée de la sorte à succomber à de véritables exactions ; de plus elle aurait pour soutiens contre les lois d'impôts, les meilleurs avocats : des assurés nationaux.

Les considérations qui précèdent jettent un jour sombre sur l'assurance envisagée à un point de vue international. Accueillie autrefois avec faveur par les gouvernements, elle est devenue un sujet de défiance, des ignorants et des demisavants se mèlent de légiférer sur les questions scientifiques que des actuaires seuls peuvent résoudre, et des financiers sans discernement ou sans scrupule les surchargent de contrôles, de taxes, et de mesures vexatoires et frustatoires, dirigées surtout contre les sociétés étrangères.

Il est désirable qu'une protestation énergique s'élève contre des tendances, qui en certains pays prennent le caractère d'une véritable spoliation. Il est désirable aussi qu'un examen approfondi, sur des questions déterminées, permettent aux Congrès futurs d'exprimer une opinion sur le traitement législatif de nature à assurer l'existence normale d'une société d'assurance, tant dans son pays d'origine qu'au dehors.

Il est compréhensible que les sociétés étrangères soient soumises à des formalités propres à établir leur constitution régulière et leur état financier. Les sociétés en général, notamment les sociétés anonymes, sont actuellement sujettes dans la plupart des pays à des publications, tant en ce qui concerne leurs actes constitutifs que leurs bilans. Il n'y a aucune raison pour que sous ce rapport il y ait une différence entre les sociétés régnicoles et les sociétés étrangères, les mêmes raisons d'intérêt public existant pour que les unes et les autres fassent connaître les garanties qu'elles offrent à ceux qui traitent avec elles.

Il est juste aussi que les sociétés étrangères, ayant un objectif de prévoyance, n'établissent pas à la légère un siège d'opérations dans un pays, sans que les assurés aient quelque certitude quant au maintien de ce siège. La difficulté consiste à établir des règles à ce sujet. Mais il semble qu'il n'y aurait pas d'injustice à exiger d'une société d'assurance sur la vie étrangère, qu'elle prenne certains engagements de durée et qu'elle soit astreinte à une représentation régulière et durable dont les titulaires soient soumis à certaines formalités et responsabilités, pour l'execution du mandat qui leur est confié.

D'un autre côté il y a lieu de demander de la part des gouvernements, certaines garanties pour que les sociétés, qui sont venues s'établir dans un pays en vertu des lois générales du pays, ou en vertu d'autorisations spéciales, ne soient pas exposées à devoir le quitter brusquement. Les traités de commerce entre divers pays stipulent en faveur des associations commerciales, industrielles et financières, et en particulier des sociétés anonymes, qu'elles sont admises à exercer tous leurs droits et à ester en justice sur le territoire des puissances contractantes, moyennant de se conformer aux lois du pays et aux règles de la réciprocité. Il y aurait une extrême utilité à ce que des droits spéciaux en rapport avec leurs besoins soient reconnus par les traités de commerce ou par des traités particuliers aux sociétés d'assurance sur la vie, afin que dans leur intérêt et dans l'intérêt de leurs contractants étrangers, leurs établissements ne soient pas exposés à une existence précaire.

Et l'on doit envisager avec une extrême circonspection l'établissement de sièges d'opérations dans des pays où les sociétés sont soumises

à l'arbitraire d'un pouvoir administratif leur octroyant ou leur retirant le droit d'exercer leur industrie.

Quant au contrôle, il doit être institué par les gouvernements, non au moyen de vérifications effectives dépendant de la capacité, de la régularité, et il faut bien ajouter en certains cas du bon vouloir de fonctionnaires dont beaucoup seront fatalement inexpérimentés ou ignorants de cette matière si spéciale, mais par la publication des états de situation sous la responsabilité des représentants régnicoles de chaque pays où la compagnie a un siège, et dans des formes analogues à celles adoptées en Angleterre.

Toutes autres entraves au fonctionnement libre des sociétés d'assurance me paraissent devoir être énergiquement combattues. Les taxes et les impôts sur l'assurance sont des contributions mauvaises qui atteignent l'epargne dans ce qu'elle a de plus respectable, de plus digne de sollicitude, et dont l'excès peut entrainer la ruine des institutions qui en sont gardiennes et par suite celle de leurs assurés. Il y a là une question de mesure dont il est difficile d'indiquer la limite ; la stabilité des impôts et l'intervention des assurés dans ceux qui frappent directement les transactions ont une grande importance dans la solution.

Mais je considère comme inadmissibles :

1°. Les cautionnements dès qu'ils dépassent un montant modéré destiné simplement à prouver que la société n'est pas sans ressources dans le pays, et qu'elle possède les moyens financiers que demande une institution sérieuse.

2°. Les dépôts de fonds exigés par certains Etats sous prétexte de réserves à consigner entre leurs mains dans l'intérêt des assurés, en proportion des engagements.

3°. Les privilèges accordés sur ces fonds en faveur des assurés d'un pays à l'exclusion des assurés d'autres pays.

4°. Les appropriations de fonds qui privent la société de la gestion régulière de ses capitaux et la soumettent à des emplois obligatoires.

Au point de vue de la sécurité et de l'équité, comme au point de vue des principes commerciaux et économiques, je pense que ces obligations sont préjudiciables aux institutions d'assurance, préjudiciables aux assurés, et que s'y soumettre c'est aller à l'encontre du but même de l'assurance.

Translation.

Legislation in its Commercial and Economic Aspects, as regards Life Assurance, from the National and International points of view. *By* Charles Le Jeune, *of Antwerp.*

Efforts made by governments towards the free working of assurance institutions are no longer to be reckoned on. Laws, the most reactionary, the most unjust, the most ill-considered, have been aimed at them. The inheritance of families, the savings accumulated by the laborious and the painstaking in a form so wise and so worthy as assurance, are the prey of measures of the most draconian description, and of spoliation of the most bare-faced kind.

The remarkable report submitted by Mr. R. Harding, A.I.A., to the Brussels Congress of 1895, teems with valuable notes and interesting documents on the legislative treatment of life assurance institutions in many countries; and other members added remarks which completed the data for their respective countries. For the United States, Mr. Howell William St. John, Ex-President and Member of Council of the Actuarial Society of America, and, for Canada, Mr. T. B. Macaulay, Member of Council of the same Society, contributed to the same Congress substantial studies on a special aspect of the subject, namely, that of the State control of these institutions.

An examination of these essays leads to conclusions of supreme importance. Life assurance can develop successfully only if sheltered from the caprices of legislation incompatible with its necessities. These necessities are indicated by the very nature of such assurance. The operations of assurance, on account of the length of time they cover, cannot be compared with those included in the majority of other contracts. They are one of the important means of thrift of a country, and the only resource of many families. Everything which may stand in the way of the fulfilment of the engagements of assurance institutions is, therefore, highly prejudicial to the most sacred interests.

When an assurance society, after having been admitted to transact business in a particular country, finds itself obliged to cease its operations, or to withdraw, without reason depending on the public good, it sustains an injury which has the most unfortunate results to the assured of that very country, especially if it be a foreign society that is in question, on account of the disturbance introduced into the relations existing between the society and its assured. When the operations of assurance, carried out under the control of scientific methods, of which the cost is calculated, taking into account certain foreseen events, and certain contingencies, finds itself loaded with

charges out of all proportion, and unexpected, it is not only the relations between the assurer and the assured that are interfered with, but the very safety of the assured is brought into danger. When, in fact, under the plea of rendering more certain the fulfilment of the contracts entered into in its own territory, the government of a country claims to impose a lien for their protection, and with that object gives them a preference on certain of the assets of an assurance society, it destroys the principle of equality which is the salvation of the other assured not enjoying the same privilege.

These considerations are so self-evident that it was scarcely necessary to mention them. But as legislative measures are being multiplied in the most arbitrary fashion, which, although at first they had for reason and justification a control inspired by the public good, now tend to be, as it were, an embargo placed upon the capital of insurance institutions, by means of excessive taxation and confiscation of their funds under the most leonine and dangerous conditions, it seems as if a new era were being opened for these institutions in the transaction of their business in its international direction.

The most striking example of legislation pushed to the extreme limit of abuse is afforded by the Argentine Republic. By a law passed during the present year, the government is authorized to issue a special loan of seven million pesos in bonds, bearing 5 per-cent interest, 1 per-cent as a sinking fund, to which contribution is compulsory, at the price of 80 per-cent on foreign assurance companies, to guarantee the contracts entered into by them in that country. In other words, it is a forced loan, for which the life assurance funds have formed the pretext and the object: it is a real appropriation by the State of the moneys belonging to the life assurance companies and their assured.*

It is well, in the face of such facts, added to so many more, to enquire whether insurance institutions can continue to extend the circle of their operations externally, without a sure guarantee in respect of the future before them; and whether the commercial and economic conditions in which they must operate outside their own borders, are consistent with their needs, and with the nature of their operations.

But, before investigating these points, it will not be without interest to ask this question: Life assurance in its innate character, is it essentially national or international?

In looking backwards, it is certain that in its beginning it possessed a national character. The first institutions, which were founded by means of the grant by charters or licenses, had no other object than to seek in the country of their origin, the necessary elements for their life. It is only in the second half of this century that a different tendency has been developed, corresponding to the increase in commercial interchanges, and the growth of foreign enterprise.

It can be said of assurance, examined from the purely national point of view, that that is the most rational. The inhabitants of a particular country are governed by the same laws, and the judicial state to which institutions, and those who contract with them, are

* After the passing of the law, and in consequence of the protests it drew forth, among others from the British Government, against the violation of treaties which resulted from it, its operation was suspended. By a new law the Argentine Government has permitted the foreign companies to subscribe *voluntarily* to the loan which had been forced upon them. It is unnecessary to add that they acquiesced out of necessity in resigning themselves to a subscription to that loan.

subject, accords with the uniform legislation which controls them. The difficult problems of international law, as it relates to private persons, which, following the legislation of each country, regulates the conditions of strangers through the goods they there possess or the contracts into which they have entered, do not arise. The industrial foundations are simple also; the rates of mortality, the investing of funds, the carrying on of the transactions, have a harmonious character. The money of the country does not leave the country, as in the case of assurances effected with a foreign company. We see, in fact, in such a case, the premium or the capital sum paid to that society, depart to the head office abroad, to return later on to the country at the time, and under the contingencies arranged for in the contract, after leaving in the foreign hands the tithe, which is, moreover, very legitimately acquired, which the company has been able to charge in the form of profits, or of expenses incurred at home.

But it would be to display a temper out of harmony with the necessities of the age, and to misunderstand the realities which present themselves, were we to assume from what has just been said that life assurance must limit itself to its national field. It is certain that the strong current which causes nations to exchange not only their produce and their securities, but also the fruits of their intellect, will continue, thanks to the growing facility of communication, to develop foreign enterprise. Man pursues his own interest on foreign soil, and the impulse which drives men of various countries to exchange and to unite their labours, their studies, their efforts, and of which the International Congress of Actuaries is clear evidence, leads to the belief that the doors will remain wide open in all countries to institutions having for end to sow broadcast the principles of thrift and of altruism, beneficial to mankind at large.

Moreover, and for many years, accomplished facts have obtruded themselves. Great assurance institutions have carried their experience, their guarantees, their funds, into countries other than their own; they have there rendered good service, they have entered into contracts, they have established organizations; and the countries in which they have planted themselves would only lose by their withdrawal. With the thought of protecting their own people, States often forget vested interests which are important to many among their people assured in foreign companies, a consideration which should make them very careful in whatever steps they may take.

The necessities which arise in different countries are due to various causes. There are three to which I may call attention:—

1. The desire to exercise a control over life assurance institutions in the public interests.

2. The idea of national protection.

3. Financial requirements which prompt governments to find resources in taxation, and in the appropriation of assurance funds within their reach.

Under the first head I will confine myself to supporting opinions already expressed, amongst others, by Mr. George King, the eminent Fellow of the Institute of Actuaries of London, in his useful essay "On Legislation affecting Life Assurance Companies" (*J.I.A.*, xxix, p. 481). Freedom of action, and publicity secured by prescribed schedules, permitting, according to the views expressed by Mr. King,

competent third parties, by means of the particulars given in the published accounts, to check effectively the position of the assurance companies—these, in my opinion, are the only requirements to be laid down. They are applicable to all countries, without there being need to distinguish between the home country and the foreign country in which a company has an establishment.

As to national protection, two motives of different descriptions must be distinguished, the safeguarding of native policyholders, and the protection of native companies.

Some governments, looking at the distant date of maturity of life assurance contracts, and the necessity of ensuring their due fulfilment, have imposed sundry obligations on foreign companies operating within their borders, with a view to safeguard their own people assured with them. Sometimes they require deposits or cautionary funds, which are intended to furnish, in a way, material evidence of the financial resources available to the company establishing a branch in a country other than its own, and to serve as guarantee, at least to a partial extent, of the contracts into which it enters. When this security is a fixed sum, bearing only reasonable proportion to the free assets of the society, the requirement does not produce serious inconvenience, although it involves various objections which are clearly set forth in the paper submitted by Mr. Harding, to the Brussels Congress.

But it is different when the deposit is calculated on the amount of the premiums or capital sums collected, or on the mathematical reserves computed according to the methods of the company itself, or those laid down in the laws of some countries. Such deposits, when they are subject to a lien for the benefit of the contract entered into by an assurance society with the assured in a particular country, act prejudicially in a most unjust way towards the assured in other countries.

And I venture here to make a few remarks upon the views expressed by Mr. George King, in his paper mentioned above. Examining the question more particularly as it affects the United Kingdom, Mr. King says (page 519): "I think that all companies, whether home, colonial, "or foreign, should be required to retain, in the names of trustees, "British subjects, and domiciled in the United Kingdom,—at least an "amount equal to the calculated liabilities existing under the business "transacted through offices or agencies within the United Kingdom, "such assets not to be withdrawn from the United Kingdom as long as "any of such business remains in force." That, according to my opinion, is a stipulation in opposition to the interests of institutions which operate outside their own country, and contrary to the general interests of the assured. It is of no consequence that Mr. King spoke for England. In such a matter there are not two kinds of truth. I do not see, it is true, that in so many words, Mr. King seeks to grant a prior lien to the English assured on the sums thus deposited, but, if I mistake not, this conclusion seems to me to flow from his various recitals.

I hold that all privilege, all preferential rights, given to one policyholder, and which may be prejudicial to another, is an iniquity. It is not to be tolerated that, when the liabilities are borne in common, certain of the assured should be guaranteed by a special pledge, withdrawn from the general assets, and that the rest of the assured should

have as security only the balance not so hypothecated. In any case, the assured should be warned of this situation when it exists; and these companies which, in their accounts, prospectuses, and circulars, mention the guarantee funds which they possess, should at the same time make known the special liens which deprive certain of their policyholders of part of their security for the benefit of certain others. For the position of the assured in such case is as follows: those who possess special liens have as security the whole of the assets of the society, at the same time that they retain a preferential right over a part of these assets; those who have no special lien have as security only the assets less that portion pledged to the privileged assured. In case of insolvency, some of the assured would be paid in full, or, at all events, to greater advantage; while others would be their victims, and receive but the crumbs from the feast.

I think that such a state of matters is incompatible with the principles of justice and equity which should be the fundamental law of life assurance companies. Trustees of the savings of the thrifty, they owe to these the care bestowed by a father, and a father does not make difference between his children.

From a certain standpoint, it might be held that companies possessing capital and shareholders, cannot be blamed if they enter on transactions under various liabilities and conditions, according to the necessities of their business, so long as they are authorized so to do by their constitution. A proprietary company, certainly, for its shareholders, keeps in view profit. Its policyholders know this. When it allows them to participate in the profits, it makes a division. It gives to them, besides the benefit of the share capital, which, independently of the reserves special to the transactions, guarantees the fulfilment of the contracts, a share in the profits which it realizes. But it does not join them in its liabilities. In strict law, it may withdraw from them part of its guarantee, or rather withdraw it from some to give it to others, but in equity it merits blame for so doing.

My opinion, therefore, is that assurance societies should refuse any appropriation of their funds which would create inequalities amongst their insured, unless they make appropriations under like conditions in each country in which they operate. But a system consisting in the hypothecation in each country of special funds for the guarantee of the contracts entered into therein, would much resemble the splitting up of the society into sundry national societies, except that the share capital, unless it were in its turn absorbed in local deposits, would remain intact and available for losses or differences which might arise in some of the countries. The stage would, without doubt, be reached by deductions more or less logical, of classifying also the assured by nationalities, and preparing for them separate accounts, thus depriving them of the advantages derived from a large body composed of the assured of all nations.

Commercially, the splitting up of the capital is full of difficulties, of dangers, and of costs. Economically, it transforms the machinery which provides for the international interchange of funds and of security, and which, for many countries imperfectly organized, supplies a want, into a local machinery, lacking in enterprise, and deprived of its most productive elements.

And what is true for companies possessing share capital, is still

more true for those that have none. By what right could purely mutual societies remove the funds which their members entrust to them, and apply them as a guarantee to other and more highly-favoured members ?

The protection in such manner of the assured of a particular nation, can only have disastrous results, and certainly when societies suffer, and are unable to carry on their business under remunerative conditions, those who contract with them must suffer also. Even the guarantee funds would be powerless to maintain the stability of the connection between the societies and their assured ; for there is need of friendly relations between them, and of the liberal and prompt performance of the obligations undertaken.

The second motive for national protection, that which has for object to favour national insurance institutions against foreign competition, depends on the course of opinion prevailing in certain countries, and which leads them to limit interchange and protect home industries, at the risk of making their own people pay more for inferior articles. It is needless to express here any definite opinions on this subject, which is bound up with the political economy of nations. The conflicts which rage so fiercely between free traders and protectionists do not seem to me to come within the scope of the deliberations the Actuarial Congress. I shall, therefore, confine myself to the statement that, in my opinion, protection, in so far as it is intended to favour home life assurance institutions, as compared with foreign institutions, starts on the wrong path, and will be disadvantageous to the nation.

As to the employment of the funds in a fixed manner, of which the law passed in the Argentine Republic is a striking example, it is almost a work of supererogation to point out the danger. Each country, naturally, in claiming to demand security, and deposits by way of guarantee, calculated on the reserves, or by any other method, will claim, at the same time, to insist that its own credit, its public debt, shall be compulsorily used for the investment of the funds, which will practically lead to the assurance societies being deprived of the management of the funds entrusted to them. The safety of the investments, and a good return from them, are two difficulties which require in the highest degree, for the executive of assurance societies, liberty of action. In some countries security is lacking, and the number of countries which have ceased to honour their engagements, becomes larger and larger. In other countries there is liability to instability in the legal currency. While there, where security is the most established, the rate of interest on the State bonds is so low that it does not furnish the necessary return on the capital. Taxes are another evil which drain the resources of assurance institutions, and which, on account of the arbitrariness reigning in certain countries, might ruin them. They assume the most varied shapes, and even that of differential duties, according to which foreign societies have to pay higher taxes than native ones. In principle, taxes, at least those which attach directly to the transactions, should be borne by the assured. A company in this way would not find itself exposed to the risk of being overwhelmed by unstable exactions ; and, moreover, it would have the support, against the taxation laws, of the best advocates, namely, the assured of the country itself.

The preceding considerations throw a lurid light over assurance, as viewed from the international standpoint. Welcomed formerly with cordiality by governments, it has become the object of distrust. The ignorant and the half-instructed meddle with legislation or scientific questions, which actuaries alone can solve; and financiers without discernment, or without scruples, load them with fetters, with taxes, and with vexatious and obstructive regulations aimed specially against foreign societies.

It is desirable that a vigorous protest should be raised against tendencies, which in some countries assume the character of real spoliation. It is also desirable that a thorough investigation on determinate questions should permit of future Congresses expressing an opinion on the nature of legislation fitted to secure the normal existence of an assurance society equally in its own country and abroad.

It is comprehensible that foreign societies should be subjected to formalities suited to prove their due establishment and their financial state. Companies generally, and especially joint stock companies, are actually called upon in the majority of countries to submit to publicity, both as regards their memorandum and articles of association, and as regards their balance sheet. There is no reason whatever why, in this respect, there should be any difference between home and foreign societies, the same reasons of public policy existing for both the one and the other to make known the security offered to these contracting with them.

It is also right that foreign societies, having thrift for their object, should not lightly open a field of operations in a country without the assured having some certainty as to the permanence of that field. The difficulty consists in framing rules on this point. But there would not appear to be any injustice in requiring of a foreign life assurance society to make certain pledges of permanence, and that it should be bound to have a regular and durable representation, the trustees of which should be subject to certain formalities and responsibilities for the fulfilment of the mandate laid upon them.

From the other side, there is cause to require from governments some sort of guarantee that societies which have established themselves in a country in virtue of the general laws of the country, or in virtue of special authorization, shall not be exposed to the danger of having to withdraw suddenly. Commercial treaties between different countries stipulate in favour of commercial associations, industrial and financial, and particularly of joint stock companies, that they shall be permitted to exercise all their rights, and to sue and be sued in the territories of the contracting parties, provided always that they comply with the laws of the country, and to the rules of reciprocity. It would be very useful were special rights, suitable to their needs, recognized by commercial treaties, or by treaties special to life assurance companies, so that in their own interests, and in the interests of their foreign policyholders, their existence should not be exposed to a precarious tenure.

And we must look with the greatest caution upon the establishment of operating centres in countries where the societies are subjected to the arbitrary control of an administrative authority, granting or withdrawing the right to carry on the business.

As to supervision, it must be instituted by the governments, not by means of effective audits, depending on the capacity, the strictness, and, it must be added, in some cases, the good intentions of functionaries, many of whom will be hopelessly inexperienced, or ignorant of a matter so special; but by the publication of statements showing the financial position, on the responsibility of the local representatives in each country where the company has an office, and in forms analagous to those adopted in England.

All other interference with the free working of insurance companies, it seems to me, should be strenuously opposed. Duties and taxes on insurance are mischievous levies, which strike at thrift in its most worthy aspect, that which deserves to be most encouraged, and an excess of which might result in the ruin of the institutions that are its guardians, and, as a consequence, the ruin of those assured therein. Here is a question of degree of which it is difficult to fix the limits. The stability of taxation, and the placing on the assured that which directly affects the transactions, have an important bearing on the solution of the problem.

But I consider to be inadmissible :

1. Deposits, if they surpass a moderate amount intended merely to prove that the society is not without resources in the country, and that it possesses financial means suitable to a responsible institution.

2. The deposit of funds required by some States on the plea that they are reserves to be held in their hands in the interest of the assured, in proportion to the liabilities.

3. A lien granted on these funds in favour of the assured in one country, to the exclusion of the assured in other countries.

4. Such retention of the funds as will deprive the companies of the complete management of their accumulations, and subjecting them to compulsory forms of investments.

From the point of view of safety and of equity, as from the point of view of commercial and economical principles, I think that such requirements are prejudicial to the assurance institutions, and prejudicial to the assured, and that to submit to them is to run counter to the very purpose of insurance.

On Legislation in the United Kingdom as affecting the Life Assurance Contract.

By Arthur Rhys Barrand, F.I.A.

The contract of life assurance is one that, while exhibiting all the features of an ordinary contract, yet involves, in addition, so many special and important features that, as might have been expected, there has arisen in many countries a considerable body of legislation dealing exclusively with it. The extent and nature of such legislation differ widely in different countries, and it would take me far beyond the limits allotted to me for dealing with my subject were I to attempt, even in a cursory manner, to describe the various useful or objectionable forms which the special laws enacted in connection with the life assurance contract have taken in various parts of the world. Such an attempt indeed at an International Congress of Actuaries would indicate great presumption upon my part, and would, even if successful, by its length tend to defeat the object of my paper, that object being merely to introduce the subject with a view to a general discussion as to the effects experienced in practice from existing legislation, and as to the lines along which such legislation can be advantageously increased or modified.

With this object in view, I have thought it best that I should describe briefly the course which such legislation has taken in this country, the reasons which have led to it, and some of the results in practice, leaving it for the most part to those who have had far more experience than myself to suggest any modifications in the laws either of this country or of others. This method commended itself also to me by the consideration that life assurance, in its essential features, is the same in all countries, and that, allowing for certain modifications in details, a system of legislation which could be shown to be satisfactory in one country might reasonably be expected, with necessary minor changes, to be equally satisfactory in another country.

The subject may be approached either historically or by classifying the various laws according to the principles on which they are based, and it has seemed to me that, for the special purpose in view, the latter method will be the better for dealing with the subject. This view commends itself on the ground that, as a general rule, though with exceptions, a contract is a matter for agreement between the parties to it, and the province of law in such a matter is rather to enforce the obligations entered into between the parties than to interfere with the nature of those obligations. It is hardly necessary for me to point out that the ordinary life assurance contract presents

the usual aspects of agreement and obligation which characterize a legal contract, and any interference by the Legislature with such a contract should therefore justify itself by showing that there exist, in addition, such special features in this particular contract as warrant legislation, having for its object the protection or restraint of one or more parties to it. It is not altogether easy to classify all the legislation that has been enacted, under two or three heads, as many of the laws appear to be of a mixed character, and to partake both of restraint and enlargement, but I think they may be approximately divided into three classes, namely: (1) those based on considerations of public policy; (2) those based on the capacity of the parties to the contract; and (3) those based on the beneficial nature of life assurance. I may point out, however, that the classification is merely a matter of convenience in dividing the subject, and any difference of opinion as to which of the divisions any given law should be placed in, or whether it properly comes within the description of any one of the divisions used, will in no way affect the real object of my paper as already described.

1. Laws based on considerations of Public Policy.

The chief of the laws coming under this heading is that relating to insurable interest. Under a statute passed in the year 1774, and usually known as the Gambling Act, it was enacted that no assurances should be effected on the life of any person or on any event or events whatsoever wherein the person for whose benefit such assurance was proposed had no interest. It is sufficient under that Act if the interest exists at the time the assurance is effected, although it may have ceased before the sum assured becomes payable. The amount recoverable is also limited by the amount of the insurable interest at the date of the policy, so that if the assured should effect assurances in several offices, each for the full amount of his interest at the time, he will, on receiving the amount from one office, be precluded from recovering any amount from the others. The Act also requires that the names of the persons interested in the policy shall be inserted therein. The interest contemplated by the Act is a pecuniary one, such as that of a creditor in the life of his debtor, or of one of two joint obligors in the life of the other. Mere relationship is considered as giving no such insurable interest, the one apparent exception being the interest of a wife in the life of her husband. There has been a tendency in recent times, however, to take a somewhat broader view of the Act, and it has thus been held that where a person has undertaken the maintenance of a child, for whose support he was not legally liable, he had an insurable interest in the child's life to the amount of his actual expenditure. It is to be observed that the Act does not in any way penalize the company granting the assurance, but only denies to the assured any right of action against the company in respect of assurances effected without insurable interest. The company is therefore in the enviable position of an individual who makes a bet on a certainty, for not only can the claim be repudiated, but an action to recover the premiums paid on the ground that no risk has been incurred, will also fail. I need hardly explain, however, that self respect and self interest combine to deter modern life assurance

companies from granting such assurances; indeed, the total repeal of the Gambling Act would scarcely, if at all, affect the present practice of offices. It is evident that when anyone having no insurable interest in a life wishes to assure it, he does so as a rule because he knows or thinks that he knows it to be below the average, and therefore anticipates a profit from the transaction. Unless, therefore, the office considers that it is likely to form a better opinion as to the merits of the life proposed for assurance than one who is probably intimately acquainted with it, they will wisely decline to have anything to do with it; and, as a matter of fact, this is precisely the course adopted by offices in the present day. Judging from the abuses to which assurances had become subject in the latter part of the 18th century, it was, no doubt, necessary to check as far as possible the evils arising therefrom, and, judging from what transpires from time to time as to assurance transactions entered into by private individuals and firms, even to-day, some further legislation may yet become necessary on this point. With respect to assurance companies, however, even if they were originally tainted to any extent with the abuses which led to the passing of the Act of 1774, that law, and the perhaps even more potent law of self interest, have long since proved efficient schoolmasters in leading them into better ways, and the eyes of their understanding being enlightened, they may now be safely trusted to act up to or even beyond the spirit of the Gambling Act, even though that law should be repealed to-morrow. In fact, assurance companies have come to see that to effect an assurance where no insurable interest exists, is worse than a crime, it is a blunder.

In suggesting that, as far as companies are concerned, the Gambling Act has practically become obselete, I shall, no doubt, encounter the criticism that even now assurances are occasionally disputed on the ground of the absence of insurable interest. This is, no doubt, the case, but I venture to submit that where an assurance is repudiated on this ground, in the majority of cases the reason given is only the ostensible one, and that such a defence is only resorted to where there is good ground for suspecting fraud, of which, from the nature of the case, it may be difficult, or even impossible, to obtain complete legal proof. In such a case it is, no doubt, advantageous to be able to fall back upon the Gambling Act if it is applicable, and for that reason many would favour its retention upon the Statute Book, although almost obsolete as far as its original purpose is concerned. It is difficult to believe that any assurance company would, at the present day, dispute a claim solely on account of there being no insurable interest, as, if the life assured proves to be unexceptionable, no extra risk has been run beyond that paid for in the premium, and a spirit of fairness would suggest that a risk fully known and considered at the inception of the contract, should not afterwards be repudiated on what, under such circumstances, would be properly described as purely technical grounds.

In connection with the Act of 1774, reference may be made to certain statutory relaxations of its restrictions, which latter, as we have seen, with but few exceptions, require the assured to have a direct pecuniary interest in the life proposed for assurance. It is enacted by "The Industrial Assurance Companies Act, 1896", that an assurance

made, or to be made, by an Industrial Assurance Company, of a sum of money payable on the death of a child under the age of 10 years, which would be valid if effected with a registered friendly society, shall not be invalidated by reason of any provision contained in "The Life Assurance Act, 1774." The powers thus given, and which will be found detailed in "The Friendly Societies Act, 1896", enable parents to effect valid assurances on the lives of their children to a total amount not exceeding £6 if the child is under 5 years of age, and not exceeding £10 if the child is between 5 and 10 years of age. This statutory power is accompanied with the conditions that payment under such an assurance shall only be made to the parent of the child or his personal representative, and upon the production of an official certificate of death. There may, of course, be some slight difference of opinion as to the advisability of the exact limits of age and amount of assurance laid down in the Act, but probably all will agree as to the necessity for some limit to be fixed. The remarks already made as to the practice of assurance companies with respect to insurable interest will, however, apply equally in this case. Self-interest alone would compel companies granting such assurances to keep them within very similar limits to those imposed by statute, and, kept within such limits, there can be little doubt as to the very great advantage of such assurances to those members of the community who come within the scope of an Industrial Assurance Company's operations. I have hesitated, in fact, whether I ought not rather to include the provisions relating to infantile assurances under those laws based on the beneficial nature of life assurance, seeing that the removal by them, to a certain extent, of the restrictions imposed by the Act of 1774 is undoubtedly due to the fact that such assurances are advantageous to the community. In connection with this subject, it would be of interest, did time permit, to discuss the history of legislation in connection with friendly societies during the last 100 years or so, and to note the gradual legal recognition of their beneficial nature. I feel, however, that to do so, even in outline, would compel me to exceed all reasonable limits, and I must therefore content myself with this casual reference to the matter.

Before leaving the question of laws based on public policy, reference should, perhaps, be made to the law dealing with the subject embodied in the "lex non scripta", which, though lacking the imprimatur of the Legislature, is of equal force with statute law, and should be classed with it in a comparison of the law of this country with that of other countries having a complete code of laws. Thus, the death of the assured by "felo de se" will avoid the policy, any saving clause therein notwithstanding, and fraud, in connection with the issue of the policy, will have the same effect, although it may be expressly stipulated in the contract that it shall be indisputable under any circumstances whatever.

The foregoing remarks, while not professing in any way to give a complete account of all the laws, written or unwritten, based on considerations of public policy and dealing with the life assurance contract, may yet, I hope, be taken as indicating the direction which such laws have taken, and I think it may be safely said that there is nothing in them to which any assurance company, desiring to conduct its affairs on fair and business-like lines, can reasonably object.

2. Laws based on the capacity of the Parties to the Contract.

It would, perhaps, be more correct to describe the laws referred to under this head as those based on the *incapacity* of the assured, since it is from that point of view that the legislation, to which reference will now be made, has been enacted. The business of life assurance is of such a peculiar nature, that the ordinary information furnished by joint-stock companies, which, in such cases, is sufficient, apart from fraud, to enable the shareholders to form a fair idea as to the solvency of the concern, is altogether inadequate, in the case of a life assurance company, to achieve the same end. Fuller particulars, and many additional ones, must therefore be furnished, or the members must be left, to a great extent, in the dark as to the true position and prospects of the company. Leaving undiscussed, at least for the present, the question as to whether the stress of competition would not compel the publication of the facts necessary to establish, beyond doubt, the solvency of a company, it will, I think, be readily admitted that the incapacity of the ordinary policyholder to satisfy himself on that point, in the absence of special information furnished by the company, establishes a strong "primâ facie" case for legislative interference on his behalf. In ordinary contracts, the law interferes to protect one of the parties who may be suffering from any special disability, such as infancy or lunacy, and although, perhaps, such cases are not altogether on all fours with the position of the assured under the contract of life assurance, yet the positions are not, in reality, unlike; and most of the arguments that are used to justify interference with the former class of contracts may also be used, with but slight modifications, to justify special legislation for the protection of the holders of life policies. Another argument in favour of interference in the contract of life assurance by the State for the benefit of the assured, and one which is, perhaps, even stronger than the foregoing, is to be found in the widespread and disastrous consequences which must necessarily follow from the insolvency of a large life assurance company, not only to those who are assured in that company, but also to the far larger number whose confidence in such institutions generally is rudely shaken, and who are thus led to distrust and reject one of the most beneficent institutions that modern civilization can show. Looked at from this point of view, the legislation now referred to might appropriately be classed with those laws founded on public policy, but as the description for the second class of legislation may, in reality, be regarded as a sub-division of the principle of public policy, I have decided to retain it in its present form.

It may be pointed out in passing that the legislation referred to under this head, although primarily intended for the protection of the assured, operates also as a safeguard to sound and solvent companies against unfair and dishonest competition on the part of insolvent companies. It is manifest that the latter, as long as there is nothing to check their career, can, by disregarding the necessity to make adequate provision for future liabilities by present accumulations, offer terms and advantages in the immediate present, with which it is impossible for soundly conducted offices to compete. The result is that in the absence of efficient legislation ensuring the continued solvency of all companies carrying on life assurance business, it will be possible

for unsound and insolvent offices to prosper at the expense, both of the public who may be induced to insure in them, and of companies whose integrity handicaps them in the competition for business. From this point of view, the opposition to such legislation which has frequently been shown by life assurance officials appears to be not only uncalled for but also mistaken; since laws making it possible for the fit only amongst assurance offices to survive, are in the best interests both of the public and of properly conducted assurance companies. Such laws must, however, comply with certain conditions, and it is mainly on the question as to how far these conditions are fulfilled by existing legislation that controversy is likely to arise. The necessary conditions that must be complied with by legislation claiming to be adequate to the object aimed at are: (1) such legislation must effectually prevent any company from carrying on the business of life assurance unless it is quite solvent, and (2) this end must be attained without unnecessarily harassing or interfering with sound companies in the transaction of their business.

Before discussing the question as to how far the legislation of the United Kingdom on the subject complies with these conditions, it will perhaps be advisable to give an epitome of that legislation, which is contained in the Life Assurance Companies Acts, 1870 to 1872. These Acts impose the following restrictions and obligations upon all assurance companies carrying on business within the United Kingdom:—

(1) Such companies are required to make a deposit of £20,000 with the Chancery Division of the High Court, such deposit to be returned when the life assurance fund, accumulated out of premiums, amounts to £40,000. The deposit forms part of the life assurance fund and is subject to the provisions of the Acts relating to that fund. The deposit is invested in such securities as the Court may approve, and interest on it is paid to the depositors.

(2) In companies carrying on other business than life assurance, the receipts from the life assurance business are to be carried to a separate fund called the life assurance fund, and the fund so formed is to be a security for the life policy and annuity holders, and is not to be liable under contracts entered into by the company in respect of its other business.

(3) An amalgamation of two companies or the transfer of the business of one company to another is only to take place with the sanction of the Court, and after due notice and full particulars of the proposed arrangement have been sent to the policyholders in both companies in the case of amalgamation, and to the policyholders of the transferred company in the case of transfer. The sanction of the Court is not to be given if policyholders representing one-tenth or more of the total sum assured in either company dissent from the proposed amalgamation or transfer. If the proposed arrangement is carried out, reports showing the financial position of the companies concerned, with certified copies of the actuarial and other reports on which the arrangement is based, must be deposited with the Board of Trade within ten days of completion, together with a declaration by the principal officer of each company to the effect that there has been a full disclosure of the true consideration for such amalgamation or transfer in the reports so deposited.

Provision is also made, that where one company has been transferred to another and creditors of the former have claims against the latter, on the winding-up of the latter, the former may also be ordered to be wound-up, if it shall appear to the Court that such procedure is just and equitable. It is also provided that a policyholder in a transferred company paying a premium to a company to which it has been transferred, shall not, thereby, be deemed to have abandoned any claim that he may have against the former, unless he has signified in writing such abandonment.

(4) On it being proved to the satisfaction of the Court, that a company is insolvent, an order will be made, on the application of one or more policyholders or shareholders, for the winding-up of such company, but the Court may, in its discretion, reduce the contracts instead of making an order for winding up. In the event of the winding-up of a company, the policies and annuities are to be valued by a net premium method, using the Seventeen Offices' Experience and 4 per-cent interest.

(5) A revenue account and balance sheet are to be furnished every year, and a valuation is to be made by an actuary once every five years, if the company was established after the Act, and once in ten years if established before, or at such shorter intervals as the company may choose. The results of such valuation are to be sent to the Board of Trade within nine months of the date up to which the accounts are taken. Power is reserved to the Board of Trade, with the consent of the company, to alter the form of the returns to be furnished by that company, for the purpose of adapting them to the circumstances of the company or of better carrying into effect the objects of the Act. Provisions are made for the authentication of the returns by the chief officials of the company, and for furnishing copies of the same to every shareholder and policyholder of the company on application. The returns are finally to be laid before Parliament by the Board of Trade.

(6) In case of default in complying with the requirements of the Act, a penalty of £50 per day is imposed; and if default continues for three months after notice of such default by the Board of Trade, the Court may, on the petition of one or more policyholders or shareholders, order the company to be wound up, in accordance with the provisions of the law relating to joint stock companies. Other penalties are imposed for knowingly furnishing false information in the returns.

The schedules which give the forms in which the returns are to be made to the Board of Trade require, amongst other things, the revenue account and balance sheet; the date, method and basis of the valuation; the results brought out by that valuation in detail; particulars as to the distribution of profits; the whole-life office premiums in use; particulars of the business in force, distinguishing whole-life assurances from other forms; the total premiums that have been received upon the latter from the commencement; particulars of annuities in force, distinguishing immediate annuities from others; the average rate of interest at which the funds have been invested during each year since the last valuation; particulars of surrender values and of the way in which unhealthy lives have been dealt with. Separate statements are required to be furnished for business at other than European rates.

Of the provisions contained in the above-mentioned Acts, that

providing for a deposit of £20,000 before business can be commenced appears to be altogether beneficial and renders it reasonably probable that the new company will be able to meet all its engagements up to the date of the first valuation, after which, if the legislation is efficient, there should be no further question as to solvency. The provision has, however, been evaded by a new company taking the name of a company established before the Act, and which had practically ceased to exist, and also by foreign companies, which, if their life assurance fund accumulated out of premiums already exceeds £40,000, have the deposit returned immediately. The Acts would seem to require amendment to meet these cases, and such an amendment might also, with advantage, require foreign companies transacting business here, to keep in this country a reserve equal to that required by their valuation to meet their British liabilities.

The provision for the separation of the life assurance business from any other business carried on by the company is also called for by the broad difference which exists between life assurance and every other form of business, the distinction being a vital one, in spite of many apparent points of agreement.

The provisions relating to the transfer or amalgamation of life assurance companies were called forth by the great evils resulting from a practice, that had to some extent prevailed, of one assurance company, itself scarcely solvent, absorbing several other companies in a worse financial position than itself; until the absorbing company, with its undigested absorbed companies, became itself insolvent, and involved in its ruin many thousands of policyholders. Those portions of the Act which were designed to prevent such a state of affairs from happening in the future seemed to have answered their purpose moderately well, the principal difficulty being their want of elasticity. This is a difficulty which must always arise when the attempt is made to apply precise laws to varying circumstances, and perhaps it is nowhere felt more than in the laws affecting life assurance companies. The difficulty might perhaps be got over by giving a wider discretion to the court in sanctioning a proposed transfer or amalgamation, and requiring, at the same time, that the court shall have the assistance of expert assessors, as is at present done in Admiralty cases. The court has at present the power, if it chooses, to have assessors for its guidance in any case, but apparently such aid has only been sought in Admiralty cases, though it would certainly seem that expert advice is required at least as much in life assurance matters. It would perhaps be sufficient to give similar powers to the court in cases of transfer or amalgamation, as is already given in the case of the winding-up of joint stock companies, where, in addition to certain specified circumstances under which a company can be wound up, it is enacted that it may also be wound up if it appears to the court just and equitable that it should be so dealt with, and in a recent case this discretion has been given a somewhat broad interpretation. It should be noted that the provision for transfer or amalgamation is a restrictive and not an enabling one, so that if a company has not power under its constitution to transfer or amalgamate, these Acts do not give it power.

The remaining provisions of the Acts, including the schedules giving the forms in which the returns are to be made, and particulars

of those returns, may be considered as the contribution of legislation in this country towards ensuring the continued solvency of life assurance companies carrying on business here. It is difficult, however, to see that such an object is or can be achieved by the Acts; and if it be admitted that efficient legislation to ensure that end is desirable, considerable alterations must be made in them.

In the first place, little or no real security is afforded against deliberate fraud on the part of the officials of the company. If, as has been stated, the returns required to be made are intended to enable an independent actuary to check the valuation, and if, moreover, it be admitted that the returns are sufficient for this purpose—a somewhat large admission—yet if fraud is intended, it can just as readily be applied to the data on which the valuation is based as to the results of that valuation. The penalties imposed by the Acts are altogether inadequate to prevent such fraud, and if it should be deemed necessary to legislate with a view to rendering fraud practically impossible, the most direct course open seems to be to insist upon a valuation by a Government actuary who should take the original data and conduct a complete valuation himself. Even under this arrangement, fraud might still be possible, but the possibility would be greatly lessened, and might be considered to be effectually prevented as far as legislation can achieve that end.

It would, however, be possible to attain that end almost as effectually, and in a much less objectionable way, by having the returns certified by an actuary whose professional standing should be a sufficient guarantee of the absence of fraud. At present, although the returns have to be signed by an actuary, no professional qualification or status is demanded of the individual so described, and his signature, therefore, carries with it only the weight arising from personal knowledge of the individual himself. If, however, it be enacted that the actuary certifying the returns must be a member of a professional institution, such as the Institute of Actuaries or Faculty of Actuaries, membership of which would be at once forfeited by anyone found guilty of professional misconduct, such certification would probably be a sufficient guarantee of the absence of fraud, without it being necessary to have any personal knowledge of the individual giving such certificate.

The difficulties with which legislation, on the lines of the Life Assurance Companies Acts, usually has to deal, are, however, rather those arising from what may be termed undue optimism than from deliberate fraud. It is natural and laudable for the officials of a company to take a rosy view of the position and prospects of their office, even when, to unprejudiced outsiders, the situation is anything but satisfactory. Such optimism may, however, if carried too far, bring irretrievable disaster upon its policyholders, and, indirectly, upon the whole assurance world. Take, for example, a company which has spent large amounts in the acquisition of new business, and has in other ways been extravagantly managed, and finds itself in consequence unable to provide the reserve for its policies which a valuation on a sound basis shows to be necessary. Under these circumstances a hopeful view is taken of the mortality and investments, a lax mortality basis is employed, a high rate of interest is used,

negative values are freely taken advantage of to reduce the total liability, and if, even then, the assets are insufficient, these can be assumed to have increased in value since purchase, and their amount can be further swollen, if necessary, by the inclusion of such convenient items as extension expenses, which can be made sufficiently elastic to balance any inconvenient deficit.

The efficiency of the Acts to ensure the solvency of companies must be tested by their application to cases of this nature, which are the ones most likely to arise in actual practice, and I venture to think that, applied to such a case, they are practically useless. The company is at liberty to adopt whatever valuation basis it may choose, and although occasionally the Board of Trade will demur at the reduction of the reserve by the inclusion of negative values, or to the introduction into the list of assets of such an item as that already referred to, yet, even when such a protest is made, the final outcome is a remark to the effect that the Board has no alternative but to lay the correspondence in reference to the matter before Parliament with the returns; and there the matter ends, except that the correspondence is published with the returns in the volume issued annually by the Board of Trade.

As far as the Board of Trade is concerned, the end of its power is reached when it has appealed to public opinion by the publication of the correspondence; and although it has been frequently asserted that such public opinion is sufficient to ensure the stringency of the valuation, in practice the result is very different. Public opinion may have a very potent influence under certain circumstances, but those circumstances can hardly be said to arise when an average member of the public is being canvassed by an enthusiastic assurance agent. In 99 cases out of 100, the person canvassed has never heard of the Board of Trade returns, and, even if he had, the statement that a company valued by the Carlisle Table at 4 per-cent, by a gross premium method, and included negative values, would convey about as much meaning to him as a line of cuneiform inscriptions. If publicity and public opinion really had the effect attributed to them, the new business of a company should be in proportion to its financial soundness, other things being equal, whereas it is well known that certain companies, whose financial position leaves much to be desired, show results in the shape of increase of business which are far in advance of those obtained by other companies occupying a much sounder position. The fact is, that the theory as to the sufficiency of publicity and public opinion, enlightened occasionally by the correspondence of the Board of Trade, being sufficient to ensure the solvency of life assurance companies, is breaking down, and if further argument on this point were needed, it could be found in the success which has attended the operations of certain assessment companies in the past. Actuaries have been unceasing in their efforts to enlighten the mind of the public as to the fallacies underlying the operations of companies of this description, but such efforts have been, comparatively speaking, unavailing, and the decline in prosperity of many of these companies must be put down, not to these efforts, but to the very practical argument of increased contributions. In view, therefore, of the inefficiency of publicity and public opinion to ensure the solvency of life assurance companies, and the great interest the

community has in ensuring such solvency, I venture to think that a case is, at least to some extent, made out for more effectual legislation directed to this end, and I will endeavour, in a few words, to indicate the directions which, in my opinion, such legislation should take.

(1) The valuation and such returns as are deemed necessary, should be made annually. Under the present Acts, any company can, if it choose, make its valuation and returns at intervals of five years, and some companies need only do so at intervals of ten years. It is evidently possible for a company to be perfectly solvent at one valuation and quite insolvent before the end of five years from that time, and it would seem, therefore, that whatever method of State supervision is adopted, must be applied at intervals not greater than one year. The period from the date of valuation, within which the returns must be deposited with the Board of Trade, should also be reduced. The arguments that have been brought against annual valuations in the past on the ground of the trouble and expense involved, can hardly be said to have any weight now, seeing that the four largest assurance institutions in the world have for some time past valued their business annually. I need hardly say that an annual valuation and annual returns do not necessarily involve an annual distribution of surplus.

(2) The returns to be supplied to the Board of Trade should state the method of the valuation and its basis as to interest and mortality; the results brought out on that basis after rejecting any negative values; the total difference between the office premiums and the premiums valued; the rate of interest realized on investments, such rate being taken from a comparison of the interest received, less income tax, with the total assets whether bearing interest or not; and the difference between the actual and expected death strain during the year. The revenue account and balance sheet should be furnished, and the assets in the latter certified by the accountant of the Board of Trade. Assuming the absence of fraud and of mistake in calculations, such returns should enable any competent actuary to form a satisfactory opinion as to the solvency of the company.

(3) As already suggested, the valuation report and returns should be certified by an actuary of such professional status as shall suffice to practically eliminate any likelihood of fraud. Such a certification may also fairly be taken as a guarantee of the accuracy of the calculations, so that when the returns are thus presented, it will be safe to assume that the results shown are those which really arise from the given valuation basis. It will therefore be sufficient to give the actual totals only instead of the details which make up those totals, and it will be unnecessary to furnish those further particulars which are supposed to enable an independent actuary to check the results.

(4) On the returns being presented to the Board of Trade, the official actuary should have power if he considers, from the returns presented, that the company is insolvent, to call upon it to furnish him with such further particulars as may enable him to satisfy himself on this point; and if then it still appears to him that the company is insolvent, he should be empowered to apply to the Court for an injunction restraining the company from carrying on the business of life assurance in this country. The Court should consider such

applications, with the assistance of duly qualified assessors, and on being satisfied, after hearing the Board of Trade and the company, that the latter is really insolvent, it should grant the injunction asked for; and the company will thereupon be unable to carry on its business until such time as it can get the injunction removed by establishing its solvency.

It is not essential to this method of State supervision that a fixed standard of solvency should be established, and indeed there are many objections to such a standard, the chief perhaps being that two offices may differ so widely from each other in scales of premiums, in interest realized on their funds, and, to a lesser degree, in mortality experience, that their relative position with regard to any fixed standard of valuation would afford little or no information as to their solvency or insolvency. It has also been suggested that a fixed standard is objectionable, because offices will then content themselves with a valuation on that basis, which must, of necessity, be a somewhat lax one. Experience would, however, seem to show that there is not much force in this argument, seeing that certain large offices that are subject to State supervision and a fixed standard of solvency, have recently, of their own accord, adopted a more stringent valuation basis, finding it, no doubt, advantageous to do so.

I am aware that many object altogether to the principle of State interference in any form, holding that every company should be at liberty to carry on its business in the way that seems best to those responsible for its management, but, as I have endeavoured to show in the earlier part of this paper, such interference as is now referred to, if efficient and not needlessly vexatious, is advantageous to solvent companies as well as to the assured. Moreover, we already have some legislation dealing with the subject, and as there is no likelihood of the present laws being unconditionally repealed, the question rather is as to whether we should be content with legislation which causes considerable trouble and expense, and does not achieve the end aimed at; or whether we should not rather seek to amend that legislation in such a manner that, without increased labour, or, perhaps, even with less labour, the desired object may be actually attained.

At present the only courses that appear open to the Board of Trade when it is convinced of the insolvency of a company are, to persuade a policyholder or shareholder to take action in the matter, or, possibly, to instruct one of its officials to effect an assurance on his own life in the company in question, in order that he may be in a position to initiate proceedings. Either of these courses would be a very undignified one for a great Government department to adopt, and, if adopted, would only enable them to effect, in a very circuitous manner, what they should be able to do directly. Moreover, under the present laws, the cost of an application to the court in respect to an insolvent company will apparently fall, at least in the first instance, on the individual policyholder or shareholder making the application, whereas if, as I think will be admitted, the solvency of an assurance company is a matter of national importance, the expense of securing such solvency should be borne by the nation.

I shall no doubt be told in further criticism of the suggestions under this head that, as the late Master of Balliol is reported to have

said, we are, none of us, infallible, not even the very young; and that even actuaries may perhaps be mistaken on the question as to whether any given office is solvent or insolvent. This is, of course, possible, but I think that if the precautions already referred to are adopted, and such others as the ripened wisdom and experience of this Congress may suggest, the risk incurred will not be greater than that inseparable from the operation of laws dealing with any subject whatever. It was once said by a great judge that a man is not hanged for committing murder, but because it appeared, beyond reasonable doubt, that he had committed it. The argument, therefore, against the course suggested on the grounds that a company might appear, to the Government actuary, to the Court, and to its expert assessors, to be insolvent, and yet be solvent, might with equal force be used against the operation of any law whatever.

The method can, I believe, be made sufficiently elastic to make it practically certain that no company with any real claims to solvency will be restrained or hindered in its operations, and where there is such a grave doubt as to its solvency as would be implied by the granting of such an injunction as that suggested, then the utilitarian principle of "the greatest good of the greatest number" imperatively demands that such a company shall be restrained from carrying on its business until it has set its house in order.

3. Laws Based on the Beneficial Nature of Life Assurance.

Under this head I propose to refer briefly to those laws which come directly under it, and also to some which are more indirectly connected with it, and with regard to the classification of which there will, no doubt, be a considerable difference of opinion.

Of those enactments directly arising from the beneficial nature of life assurance, perhaps the most conspicuous is that contained in "The Married Women's Property Act, 1882." This enables a man to effect a policy on his own life for the benefit of his wife or children, or any or all of them, and enables a woman to effect a policy on her own life for the benefit of her husband or children, or any or all of them; and thereby create a trust in favour of the object named which is not liable to be defeated by creditors as, under certain conditions, an ordinary voluntary settlement would be. The person for whose benefit the assurance is effected is thus, in a certain sense, assured against the contingencies of insolvency and death instead of against the latter alone. The reason for this enactment in favour of life assurance is apparently to be found in the fact that it is reasonable and laudable for a man to make some provision for those dependent upon him, and that, from the nature of life assurance, it is improbable that he would or could use a policy as a means of defrauding his creditors, at least in such a way as would be of advantage to himself. This latter consideration would, however, hardly apply to an endowment assurance, especially for a short term, and indeed the Act does not seem to contemplate this form of assurance. Some companies issue such policies on the strength of the Act, but the better opinion seems to be that they are not within its scope, and, even if issued, simply constitute voluntary settlements, with all the disabilities attaching to such instruments.

The Act provides for the appointment of a trustee by the assured, and, in default of such appointment, invests the personal representative of the assured with the powers of a trustee. In practice this arrangement works satisfactorily except that some difficulty occasionally arises where the beneficiaries have parted with their interests. For example, the policy may have been taken out by a man for the benefit of his wife, and they may have joined in absolutely assigning the policy to a third party. On the death of the assured if, as is very probable, no trustee has been appointed, and the wife is the personal representative of the assured, she is the only one who can give a discharge for the policy money, and this, in spite of the fact that she has absolutely assigned all her beneficial interest in it. The fact, however, that the Act does not facilitate the assignment of policies issued under it, may be counted to it for righteousness, since the alienation of such settlement policies will, in many cases, tend to defeat the provisions which the Act is intended to encourage. The only amendment in the Act which seems called for, is that its provisions in default of the appointment of a trustee should be made retrospective, and should apply to policies issued under the corresponding clause of "The Married Women's Property Act, 1870", which is very similar to that contained in the later Act, but enacts that a trustee, duly appointed by the court, is the only person who can give a discharge for the policy money. The Act of 1870, though repealed by the Act of 1882, still remains in force as regards all policies issued under it, and, on this point, frequently causes much inconvenience and expense.

Another enactment which seems, at first sight, to come directly under the present head, is that which exempts from income tax the amount paid in life assurance premiums, to the extent of one-sixth of the income. There is, no doubt, much to be said in favour of such a law as encouraging a man to the performance of what must be regarded as a most important duty; but, as a matter of fact, the enactment was based originally, I believe, on wholly different grounds. The injustice of taxing a man's income, when entirely earned by his personal exertions, on the same basis as that which is received from landed property or invested funds, has frequently been pointed out. In the former case, at death, the whole income goes, leaving nothing behind apart from the question of savings; whereas in the latter case, the income continues as before. It has therefore been suggested that in the case of an income due to a man's personal exertions, part should be regarded as sinking fund which, invested in life assurance premiums, should produce such a capital sum at the man's death as would continue the assumed real income to those who survived him. The amount apparently assumed as forming an adequate sinking fund for this purpose was one-sixth of the nominal income, and this proportion was therefore exempted from income tax when applied in this way. From this point of view, however, the enactment is altogether insufficient to achieve its object, as can be seen from a typical example. The average whole life premium between ages 30 and 40 is about £2. 10*s.* per £100 assured, and taking the case of a man whose income is £600 per annum, the amount exempted from income tax will be £100 which will provide for an assurance of £4000. This capital invested at 5 per-cent will only bring in an income of £200 per annum, whereas the income of which it is supposed to represent the capital is £500. On

the assumption that the capital can be invested at 5 per cent, a somewhat large assumption in these days, the sinking fund should be £200 per annum, providing an assurance of £8000 which will represent the capital corresponding to an income of £400, the balance of the nominal income after deducting sinking fund. If a lower rate of interest be assumed, the sinking fund must, of course, be still greater. It would therefore appear that if the provision exempting from income tax a certain portion of the income when applied in payment of life assurance premiums, is to achieve its real object, the exemption should extend to at least a third of the income instead of to a sixth as at present. The exemption as it exists at present, only applies when the assurance is effected with a British office, and is stated not to apply to industrial assurances, but there does not appear to be any logical ground for these restrictions, which might, with advantage, be removed.

The laws dealing with the alienation of policies of life assurance may also, perhaps, be dealt with under this heading, for it seems probable that such legislation had its origin, indirectly, in the fact that owing to the beneficial nature of life assurance, such contracts were in existence in very large numbers, and that circumstances were constantly arising which necessitated their alienation. To some extent, therefore, special facilities have been given by law for the assignment of life assurance policies as compared with other "choses in action", the principal legislation on the subject being that contained in "The Policies of Assurance Act, 1867." That Act provides, with certain limitations which it is unnecessary to discuss here, that the assignee of a life assurance policy shall be entitled to sue at law in his own name, that no assignment shall confer any right to sue until written notice of it has been given to the assurance company at its head office, that priority of claim under assignments shall be regulated, to a certain extent, by priority of notice, and that assurance companies shall be compelled to give written acknowledgment of the receipt of such notice. This Act has been in operation for over 30 years and, except in one respect, seems to have worked fairly smoothly, and to have satisfactorily answered its purpose. The exception arises from the obligation laid upon assurance companies to record all notices of assignment that may be sent to them. It not infrequently happens that notice of assignment is given, the charge is subsequently cleared off, the deeds in connection with it are destroyed, or it is never formally re-assigned, and when the policy ultimately becomes a claim, it is impossible to trace the original assignee in order to satisfactorily clear off the notice. Such cases as these are of fairly frequent occurrence in the experience of assurance companies, and it was mainly to meet this difficulty that "The Life Assurance Companies (Payment into Court) Act, 1896", was passed. That Act provides that where, in the opinion of the directors of the company, there exists such a defect of title as to prevent the claimant from giving a proper discharge, the money can be paid into court, and the company thus obtain a complete discharge. The preamble of the Act shows that it was intended particularly to meet those cases referred to above, in which a difficulty arises from the inability of the claimant to clear off some recorded notice; but in practice it has not proved very satisfactory. A better method of meeting the difficulty would be for an amendment of the Act of 1867 to be passed, enacting that an assignee, serving a notice of assignment

on an assurance company in accordance with that Act, shall be required to furnish at the same time an address to which communications in connection therewith may be sent, and to inform the company from time to time of any change of address. On a claim arising, in the absence of the documents relating to any notice, the company should be empowered to call upon the person giving such notice, by letter sent to the last recorded address, to produce the documents on which such notice was based, and on his failing to do so, or to take any steps in connection therewith within, say, 14 days, if resident in this country, the company should be at liberty to expunge such notice from its records, and be entitled to proceed as if such notice had never been given. Such an amendment of the Act of 1867 would greatly facilitate the settlement of claims in certain cases which not infrequently arise in practice, and would not appear in any way unjust or unfair to assignees. It would, however, be difficult to make such a provision retrospective, so that the Act of 1896, or something similar to it, would still be required to meet many cases of difficulty already existing.

In referring to the question of the assignment of policies, a word or two may perhaps be said as to the proposals that have been made from time to time, for entirely altering the method of their alienation. Such proposals have generally been based on the methods of alienation employed in connection with stocks and shares, and may be divided into two classes, viz: those based on the transfer of bonds payable to bearer, and those based on the transfer of registered or inscribed stock. The advocates of the former method would convert the policy into a negotiable instrument, the title to which would pass by delivery; and though this would, no doubt, greatly facilitate the assignment of the policy, it would greatly decrease the security of the policyholder, in that the loss of the policy would mean the loss of the claim on the company if, as might easily happen, the policy ultimately came into the hands of a *bonâ fide* holder for value. Under such a mode of assignment, the holder of a policy would have to take as great care of it as of his bank notes or bonds payable to bearer; and in view of the careless and unbusiness-like habits which characterize a large number of assurers, such a state of affairs is hardly to be encouraged. It may also be pointed out that policies of life assurance are eminently unsuitable for such a method of transfer, depending, as they do, for their maturity on the contingency of the duration of a certain life instead of on the mere efflux of time, and, therefore, requiring that the ultimate holder of the policy shall keep in touch with the life assured. The strongest argument, however, that can be brought against such a proposal is that it would tend to greatly facilitate the assignment of life assurance policies, and that such a course is to be deprecated rather than encouraged, in view of the primary object of life assurance, which is not to provide a commercial security but to make provision for the immediate relatives of the assured. There are cases, it is true, in which the assignment of a policy is necessary and advantageous, but the present law seems amply to meet such cases, and it would, therefore, be unnecessary and unwise to offer greater facilities for assignment.

There is much more to be said in favour of the proposals that policies should be assignable in a similar manner to that in which

inscribed or registered stock is transferred. The title in either of these cases consists of an entry in the register of the stock, the chief difference between them being that in the case of inscribed stock the change of title is made on the application and signing of the register by the owner or his duly appointed attorney, and in the case of registered stock, the transfer is made on production of a duly executed deed of transfer. If some such method should be adopted for the assignment of policies, the latter plan would seem to be the better, in view of the very wide area over which the assured, in an office, are scattered, and the only alterations which such a change would involve in the present system would be that, in future, deeds would be recorded in the register instead of notices of such deeds, and the documents of title would remain in the possession of the office instead of being retained by the assured, thus obviating the risk of their loss which is involved in the present system. Such a plan would do away with the difficulty, arising under the Act of 1867, of a notice being recorded but no title in support thereof being forthcoming, and would enable anyone to see at a glance the present owner of a policy. It would, of course, compel the company to adjudicate on the title from time to time as each deed was produced to it, but this would not prove a very serious difficulty, and, as a matter of fact, under the existing law, this method of assignment is practically in use in some offices, which are prepared, on the title of a policy being produced to them, under certain circumstances to issue certificates of title analogous to those issued in respect to registered stock.

Before leaving the subject of the assignment of life assurance policies, reference should perhaps be made to certain provisions relating to the stamping of such assignments contained in "The Stamp Act, 1891." It is therein enacted that no assignment of a policy of life assurance shall confer on the assignee any right to sue or give a valid discharge for any money secured thereby, unless such deed is properly stamped; and that any company paying under such an assignment shall be liable for the unpaid stamp duty and for the penalty payable on duly stamping the deed. This imposes an unfair obligation upon the assurance company, and compels them to place obstacles in the way of the settlement of claims which frequently appear to their assurers to be vexatious and frivolous. If the intention of the Act is to ensure the due stamping of all deeds, it would appear to be sufficient to retain that portion which prevents the assignee from suing or giving a discharge until his title is in order as regards stamping, and it is difficult to see why, if payment is made under an insufficiently stamped deed, all the penalty should be thrown upon the party who derives the least benefit from such payment. At present, the way in which it works in practice is to throw the onus of adjudicating as to the sufficiency of the stamping upon the assurance company; for if there is an element of doubt upon the subject, and the assignee declines to have it adjudicated upon by the Inland Revenue authorities, the company must take some risk either way. If they decide that it is duly stamped, they may make a mistake, and so render themselves liable to a penalty for paying under an insufficiently stamped deed. If, on the other hand, they decline to pay on the ground that it is insufficiently stamped, the assignee may take action against them, and produce in court his deed, adjudged duly stamped by the Inland

Revenue authorities; in which case it seems probable that the company will have to bear the costs, as well as incur the odium of having refused to pay a claim. If, therefore, it is impossible to secure a repeal of the portion of the Stamp Act referred to, it should be amended by enacting that where, in the opinion of the company, a deed is insufficiently stamped, the assignee shall have no power to sue under it until it has been produced to the company bearing the Inland Revenue adjudication stamp.

One other instance of legislation specially affecting life assurance policies, and which has doubtless arisen from the large number of such contracts in existence, is that contained in "The Trustee Act, 1893", in which special provision is made for trustees, including executors and administrators, to appoint bankers and solicitors as agents to receive policy monies. The enactment does not call for any comment, and may be left with this passing reference.

In concluding this paper, I would again point out, as at the outset, that no pretence is made of having exhaustively discussed any aspect of legislation as affecting the life assurance contract; but the endeavour has been made to indicate the chief directions and forms which such legislation has taken in this country, and, by way of brief comment, a few suggestions have been made as to the manner in which some portions of that legislation might, with advantage, be modified. I need hardly say, moreover, that I can lay no claim to originality for most of the suggestions, many of them having been current amongst actuaries for some years past.

If the result should be that, in the discussion of the subject, those members of this Congress who have had a far larger practical experience of the working of these and similar laws than I can lay claim to, should give to the other members the benefit of their wide experience, I shall feel that the objects I have had in view in writing this paper are in a fair way of accomplishment; those objects being, in the first place, the removal of all unnecessary hindrances and restrictions imposed by legislation upon the conduct of life assurance business; and in the second place, the enactment of such laws as shall best promote the true interests of assurance companies, and of those who now are or may, in the future, be assured with them.

Discussion *of Papers submitted on the question of Legislation in relation to Life Assurance.*

Mr. George King, in submitting the papers of Messrs. Richard Teece, Josephus H. Richardson, and James McGowan, explained that each of these gentlemen was peculiarly qualified to deal authoritatively with the subject. Mr. Teece was General Manager and Actuary of the largest life assurance company in the British dominions, a company which had ramifications throughout the whole of Australasia; and, in the conduct of the business, Mr. Teece had every opportunity of becoming acquainted with the laws of the different colonies. Mr. Richardson was Insurance Commissioner for New Zealand, and head of the Government Life Assurance Department; and Mr. McGowan was Actuary to the Government of Cape Colony, and had been consulted regarding the insurance laws which had been passed there.

Mr. King gave a brief summary of the papers, and drew attention to some of the peculiar provisions of the laws of Australasia. There were special regulations as to the assignment of life policies, as to securing them against creditors, and as to lost policies; regulations which did not exist in the United Kingdom, and probably not in America or on the Continent of Europe. These regulations were worthy of study, as some of them at any rate might possibly be adopted with advantage elsewhere.

The paper of Mr. Richardson, on the New Zealand Government Life Assurance Department, was worthy of careful perusal. The Department transacted a very large business, entirely confined to the colony. Its rates of premium were very low, and yet it distributed large bonuses among the policyholders. He (Mr. King) could speak with personal knowledge on this subject, as he had had the honour for a number of years, in conjunction with Messrs. A. H. Bailey and R. P. Hardy, of being consulting actuary to the Department, and he could bear testimony to the soundness and success with which the business was conducted. New Zealand afforded the only example of a large life assurance business being successfully undertaken by a government. In the United Kingdom the Government had had for many years a Life Assurance Department, but only very small policies were granted, and these were very limited in number. The paper read by Mons. Hankar, on the previous day, also showed that the Belgian Government was embarking on life assurance. But both these attempts were very different from the enterprise inaugurated in New Zealand, and this last deserved the closest attention.

M. Lepreux, in submitting the paper by M. H. Adan, read the following memorandum prepared by the author.

"Life assurance is the fortune of those who have none other."

This motto, given by Reboul as epigraph to his "Studies on Life Assurance", might serve as starting point to the subject of the developments required in special legislation necessitated by the assurance contract, when the legislator, misunderstanding the nature of the peculiar constituent conditions of that contract, refuses to reserve for it its proper place, or when he retains for it the application of ordinary law which conflicts with its innate character, because that law applies only to regulating the destinies of the fortune of those who have one—the destinies of a fortune actually acquired.

It has been attempted to show how far, where life assurance is concerned, legislation is usually backward as compared with the economic progress, and to what extent this dilatoriness renders difficult the international existence of the contract.

"Law", said Leroy-Beaulieu, "is "modified gradually in its practical "applications concurrently with the "complications and developments of "society, and as new relations and "new contracts arise between men. "Economic science, wisely interpreted, "may then indicate to the legislator "the gradual changes, of which some "are necessary and others useful."

This wise observation of the learned economist has led us to give to the first portion of the paper a general scope, starting from the relations between the two sciences, those of law and of political economy, in order to show how remarkable it was that the progress of assurance in the domain of law fell so far short of its progress in the domain of the actuary.

We have said "remarkable", because the progress achieved in the technical direction by mathematical sciences is indivisible, universal; and because it is everywhere apparent; and because this unity should bring its authority to bear and weigh in a decisive manner on the plans of the legislator, if the legislator did not so

"L'assurance sur la vie est la fortune de ceux qui n'en ont pas."

Cette formule, donnée par Reboul comme épigraphe à ses "Etudes sur l'Assurance sur la vie", pourrait servir de point de départ au thème des développements que comporte la législation spéciale réclamée par le contrat d'assurance, lorsque le législateur méprisant la nature, les conditions constitutives particulières de cette convention, se refuse à lui réserver le cadre propre qui lui convient ou lorsqu'il le maintient sous l'application d'un droit commun qui froisse son essence, parce que ce droit ne s'adapte bien qu'à la réglementation présidant aux destinées de la fortune de ceux qui en ont, aux destinées de la fortune acquise.

Nous avons tâché d'exposer combien, en ce qui concerne l'assurance sur la vie, la législation se trouve généralement en retard sur le progrès économique et combien, par suite, ce retard rend difficile la vie internationale du contrat.

"Le droit", a dit Leroy-Beaulieu, "se modifie graduellement dans ses "applications pratiques, au fur et à "mesure que les sociétés se compliquent "et se développent, que de nouveaux "rapports et de nouveaux contrats "surgissent entre les hommes; la science "économique prudemment interprétée "peut alors indiquer au législateur les "changements graduels dont les uns sont "nécessaires, dont les autres deviennent "utiles."

Cette observation si juste du savant économiste nous a poussé à donner à la première partie de notre rapport une portée générale, en prenant comme point de départ les rapports entre les deux sciences: le droit et l'économie politique, pour arriver à exposer combien il était étrange que les progrès de l'assurance sur le terrain du droit étaient demeurés aussi en arrière de ses progrès sur le terrain technique.

Nous disons étrange, parce que le progrès acquis sur le terrain technique des sciences mathématiques est indivisible, universel et parce qu'il s'impose partout, parce que cette unité devrait renforcer son autorité et peser d'une manière décisive sur les dispositions du

value the varied provisions of the ordinary law which, at all costs, he wishes to reconcile to the principles of assurance.

This position gives rise to differences of treatment in the matter of the assurance contract, so accentuated that they become vexatious from the general point of view, because they militate, more or less, against that unity so desirable in the principles which regulate the legal existence of the contract.

From these same differences there necessarily arise for the assurer difficulties of interpretation, often delicate; while, nevertheless, the question is as to a contract, devised to make good in the material sphere the loss of one single thing, namely, the life income produced by the toil of man, that is to say, by the most active and the most prolific of all social forces.

We know too well that the evils produced by mischievous legislation may be gigantic, and, as has been wisely remarked by Herbert Spencer in his chapter on the sins of law makers, these should not attempt to legislate until they have mastered their subject.

But, at the present day, veritable scientific treasures, the results of long research, have been accumulated. For more than a century life assurance has been deeply studied in England. For half a century the learned Institute, the founding of which we celebrate, has happily guided the progress of assurance. We therefore think the time has arrived when the law makers of all countries may avoid the sins pointed out by Herbert Spencer, by instructing themselves in a good school, and by furnishing life assurance with the special legislation which it deserves, and by making an effort to provide in all countries the maximum possible of uniformity.

In the second part of the paper we have protested particularly against the rules which require the formation and deposit of premium reserves by foreign companies. We wish to add a few more observations on the same subject.

We think, in fact, that the assurer who desires to regulate his conduct in acting in the most prudent possible manner, has every reason to adopt, as a

législateur, si celui-ci ne devait compter avec les dispositions si variées du droit commun qu'il veut à tout prix concilier avec les principes de l'assurance.

Cette situation engendre souvent des divergences de traitements si accusées dans le régime du contrat d'assurance, qu'elles deviennent fâcheuses au point de vue général, parce qu'elles nuisent plus ou moins à l'unité désirable dans les principes généraux qui président à la vie juridique du contrat.

De ces mêmes divergences procèdent nécessairement pour l'assureur des difficultés d'appréciations souvent délicates, tandis qu'il s'agit cependant d'un contrat appelé à réparer dans l'ordre matériel la perte d'une seule et même chose, le revenu viager produit par le travail de l'homme, c'est-à-dire par la plus active, la plus multiple de toutes les forces sociales.

Nous savons trop que les maux causés par une mauvaise législation peuvent être immenses et comme le fait justement remarquer Herbert Spencer en son chapitre sur les péchés des législateurs, ceux-ci ne devraient pas légiférer avant de s'instruire.

Mais aujourd'hui, de véritables trésors scientifiques, fruits d'une longue observation sont acquis. Depuis plus d'un siècle, l'assurance sur la vie se traite largement en Angleterre. Depuis un demi-siècle, le savant Institut dont nous célébrons la création a su heureusement présider aux progrès de l'assurance; nous croyons donc que le temps est venu où les législateurs de tous pays peuvent éviter le péché signalé par Herbert Spencer, en s'instruisant à bonne source et en donnant à l'assurance sur la vie la législation spéciale qu'elle mérite, en s'efforçant de lui donner en tous pays le maximum d'unité possible.

Dans la seconde partie de notre rapport, nous nous sommes élevé notamment contre le régime qui impose la composition et le dépôt des réserves de primes aux sociétés étrangères.

Nous désirons formuler encore quelques observations au même sujet.

Nous croyons en effet que l'assureur, qui tient à régler sa conduite en agissant avec la plus grande prudence possible, a

general rule, or to a large extent, the plan of investing the premiums in the securities of the country where they have been collected, it being assumed that the premiums and the sum assured are equally payable in the currency of the country where the assurance was effected:

1. Because, in that way, he better spreads his investments, which increases his own safety and that of his assured;

2. Because, in extending his operations abroad, it is to his interest to show to the foreigner securities with which he is well acquainted, thus giving evidence of the care bestowed in the choice of investments;

3. Lastly, because, apart from times of really sharp crisis, the investment of premium receipts in various foreign securities of first-class quality, allows of the elimination of all concern as to fluctuations in the rate of exchange in connection with payments to be made in foreign countries.

We think that these advantages, taken together, are sufficiently important to induce the assurer to employ the premiums produced abroad in securities similarly produced, and that without the intervention of any coercive measures.

tout intérêt à adopter, comme mesure générale ou dans une large mesure, l'emploi de la recette de primes en valeurs du pays où elle est recueillie, étant donné que la prime et le capital assuré se paient également en monnaie du pays producteur de l'assurance:

1° Parce que de la sorte, il divise davantage ses placements de fonds, ce qui augmente sa sécurité et celle de ses assurés;

2° Parce qu'en étendant ses opérations a l'étranger, il a intérêt à montrer à l'étranger des valeurs bien connues de l'étranger en lui donnant ainsi un témoignage de la prudence qu'il apporte dans le choix de ses placements;

3° Enfin parce qu'en dehors des périodes de crise absolument aigue, le placement de sa recette de primes en diverses valeurs étrangères de premier ordre lui permet d'éliminer les préoccupations relatives aux fluctuations du change dans l'hypothèse des règlements à opérer en pays étranger.

Nous estimons que l'ensemble de ces avantages présente une importance assez sérieuse pour provoquer de la part de l'assureur l'emploi de sa recette de primes de provenance étrangère en valeurs de même provenance, et ce sans accompagnement de mesures coercitives.

Dr. Gerkrath, in submitting the paper of Dr. Samwer, said—Insurance business has not up to the present time had any special legislation in Germany. But a scheme specially applicable to insurance was under consideration in March of the present year, in the drawing-up of which specialists of all the various branches of insurance business have been consulted. Under their advice considerable alterations have been made in the draft. This draft will possibly be published even before it is submitted to the German Parliament. The basis of this legislation seems to be, that before any company can transact business, it requires the sanction of the State, and the sanction of the State involves subsequent control on the part of the State. The action of the State in interfering with the business of a company would only take place after the matter had been submitted to a body of specialists of the particular branch of insurance transacted by the company. It is hoped that, when the special legislation has passed into law, there will be enough law for the purpose of regulating the business in Germany.

When all the foregoing papers had been submitted, Mr. Manly, the Chairman, in inviting discussion, said he was sure he was expressing all their sentiments by saying they were greatly indebted to those members who had written the papers. It was a subject in which they were all interested—interested very deeply, because, according as legislation of the State was wise or otherwise, so must life assurance have a healthy existence or a feeble one. He

was sure that an intelligent discussion of this subject, and an exchange of views, would have far-reaching results; for they might in some way be providing for wise changes in the legislation of the various States. Some States seemed to have too much legislation, some not enough. Different characteristics might require different methods of treatment, but it seemed to him (Mr. Manly) that what should be aimed at is as much freedom as possible, for commerce itself was somewhat eccentric in its growth. It required breadth to expand; it required freedom to develop; and if it was confined within rigid limits, a rank and unhealthy growth often sprang up outside those limits. Then as regarded the measures of supervision, we in Great Britain consider that we have attained the best end when we have secured complete publicity; and we leave it to public opinion in a measure to control the actions of those companies which seem to be tending in the wrong direction. And the general result had been very satisfactory. Then there was one other point calling for attention, and that was that commerce itself can be stimulated to improvement and expansion by honest competition. Some legislation seemed directed to prevent that competition. Whether that was good or not might be opened to discussion. His own view was that nothing stimulated a healthy growth more than honest competition.

M. Léon Marie (France) expressed his congratulations on the lucidity of the Paper presented by M. Massé on the present condition of assurance legislation in France.

The Paper is brief, but it would have been of no use to extend it, because, as a matter of fact, France does not possess legislation properly so-called in the matter of life assurance. Perhaps a Bill will be submitted to the next Parliament which will soon be opened, but nothing has yet been officially decided.

The speaker could not add anything to the excellent statement of M. Massé; but that which he would like actually to dwell upon was certain personal and general considerations on the question, and on the methods, in his opinion the best, of providing with a legislation in the future those countries which are yet without it.

The question can be looked upon from two different points of view:

1st, Public legislation regulating the relations between the State and the assurers;

2nd, Private legislation regulating the relations between the assurers and the assured.

There are two systems in existence as to public legislation: the system of freedom, and the system of control by the State.

The first is excellent when applied to a country where, as in England, the public has finished its education in the matter of assurance; but it is not

M. Léon Marie rend hommage à la clarté du rapport présenté par M. Massé sur l'état actuel de la législation des assurances en France.

Ce rapport est concis, mais il eut été bien inutile de l'étendre, car, à vrai dire, la France ne posséde pas de législation proprement dite en matière d'assurances sur la vie. Peut être un projet sera-t-il présenté à la prochaine Législature qui va bientôt s'ouvrir. Mais rien n'a été officiellement décidé jusqu'à ce jour.

L'orateur ne saurait donc ajouter quoi que ce soit à l'excellent exposé de M. Massé; ce qu'il désire développer actuellement, ce sont quelques considérations personnelles et générales sur la question et sur la meilleure voie à suivre, d'après lui, pour doter d'une législation, dans l'avenir, les pays qui en sont encore dépourvues.

La question peut être envisagée à deux points de vue différents:

1°. La législation publique réglant les rapports de l'Etat et des assureurs;

2°. La législation privée réglant les rapports des assureurs et des assurés.

Deux systèmes sont en présence, au point de vue de la législation publique: le système de la liberté et le système du contrôle par l'Etat.

Le premier est excellent, lorsqu'on l'applique à un pays où, comme en Angleterre, le peuple a terminé son éducation en matière d'assurance; mais il n'est peut être pas suffisant, lorsque le public n'est pas encore assez éclairé.

perhaps sufficient when the public is not yet fully enlightened.

The system of control by the State has for its essential purpose to protect the legitimate interests of the assured; but then the State must limit its interference to a minimum, so as not to fetter the development of assurance. It must leave full liberty to the companies concerning the drafting of policies, and it must not trouble itself about the rates of premium. On these two points every latitude may be conceded without danger to the companies.

The only matter in which the State should intervene is that of the calculation of the reserves, which are essential in order that the assurer may pay the sum assured. Assurances being transactions of very long date, a dishonest or incompetent assurer might collect the premiums for many years, and denude himself of them wilfully or in spite of himself when the time arrives to pay the sum promised. The State may therefore go so far as to determine the mortality table and the rate of interest to be employed in calculating the reserves. It may also require the formation of a cautionary fund to provide against losses which might arise from any marked divergence between actual results and those expected. Finally, the State may impose a limitation on investments, home and foreign, so as not to permit of the reserves, correctly calculated, being represented by illusory securities. He, the speaker, shared the opinion of M. Adan as to foreign investments.

Another serious question is immediately met with. At what figure must stock exchange securities be valued? Is it to be at cost price, or is it to be at the market price on the day the balance is struck? This question has been much debated, but the speaker refrained from expressing an opinion because time was lacking to deal with a subject so delicate.

As to deposits required by the State in certain countries, how can these be justified if the rule of these countries is freedom? If native companies may be established freely, why demand a deposit from foreign companies?

As to private law relating to life assurance, none exists in France. The

Le système du contrôle par l'Etat a pour objet essentiel de protéger les intérêts légitimes des assurés. Mais alors l'Etat doit restreindre son intervention au minimum, pour ne pas nuire au développement de l'assurance. Il doit laisser toute liberté aux Compagnies, en ce qui concerne la rédaction des polices; il n'a pas à s'inquiéter des tarifs de primes: sur ces deux points, toute latitude peut être donnée sans danger aux Compagnies.

Le seul point sur lequel l'Etat puisse intervenir, c'est la constitution des réserves, dont l'existence est indispensable, pour permettre à l'assureur de payer les capitaux assurés. Les assurances etant des opérations à très long terme, un assureur malhonnête ou maladroit pourrait encaisser les primes pendant nombre d'années, et se dérober volontairement ou malgré lui, au moment de payer le capital promis. L'Etat peut donc aller jusqu' à la fixation de la table de mortalité et du taux d'intérêt servant de bases au calcul des réserves. Il peut aussi exiger la constitution d'un fonds de prévoyance, pour faire face aux pertes qui résulteraient d'écarts notables entre les faits réels et ceux attendus. L'Etat peut enfin intervenir pour imposer une limite aux placements, nationaux et étrangers, afin de ne pas permettre que les réserves correctement établies soient représentées par des valeurs illusoires. M. Léon Marie partage l'opinion de M. Adan sur les placements à l'étranger.

Une autre question grave se pose immédiatement: A quel prix doit-on évaluer les valeurs mobilières? Est-ce au prix de revient? Est-ce au cours de la Bourse du jour où l'on dresse le Bilan? Cette question est fort discutée. M. Léon Marie ne se prononce pas, parce que le temps lui fait défaut pour aborder un sujet aussi délicat.

Quant aux dépôts exigés par l'Etat dans certains pays, comment les justifier, si le régime de ces pays est la liberté? Lorsque les compagnies nationales peuvent se fonder librement, pourquoi imposer un cautionnement aux compagnies étrangères?

En ce qui concerne le droit privé des assurances sur la vie, il n'existe en France aucune disposition légale. Le

contract of life assurance is there looked upon as a novelty from the legal point of view.

Had it been attempted to legislate on every point in this matter, there would have been the risk either of clashing with the ordinary law, or of passing laws bad from the point of view of assurance itself. Legislation has therefore been allowed to develop gradually, and it improves from day to day. When it shall have sufficiently taken shape, it will be possible, perhaps soon, to find therein the material for good legislation, conforming to the two essential conditions, namely, harmony with ordinary law on the one hand, and, on the other, with the fundamental principles of life assurance.

contrat d'assurance sur la vie y est considéré comme une nouveauté, au point de vue juridique.

Si l'on avait voulu légiférer de toutes pièces en cette matière, on aurait risqué, soit de heurter le droit commun, soit de faire une mauvaise loi, au point de vue de l'assurance même. On s'est donc contenté de laisser la jurisprudence se former peu à peu; elle s'améliore de jour en jour. Quand elle sera suffisamment assise, on pourra, bientôt peut-être, trouver en elle les bases d'une bonne loi, satisfaisant à ces deux conditions essentielles: être d'accord, d'une part, avec le droit commun et, d'autre part, avec les principes mêmes de l'assurance sur la vie.

Dr. Sprague (Edinburgh) said the fact that he was the first English-speaking member to take part in the discussion brought home to him that he was a senior member of the actuarial profession in this country. Time would not permit of the full discussion of the questions which had been raised, and he thought the best course for the senior members of the profession would be to state their opinions without going fully into the reasons of those opinions. He had listened with the greatest interest to the remarks of the Chairman (Mr. Manly), and entirely agreed and sympathized with them. Trade and commerce flourish best when left severely alone by the law; whereas, if they are put under restrictions, they develop in an unnatural manner, and cause much inconvenience of all sorts. He thought this principle applies particularly to life insurance. When life insurance is free, when promoters and managers of life insurance companies are left to manage their business honestly in the way they think best, then life insurance develops to the best advantage of the public. It would not be difficult to find examples of the evils which have been produced by well-meant attempts to place life insurance companies under restriction. One illustration of that is the enforcement of a net premium valuation, especially in the United States of America. In his opinion that has been productive of a great deal of mischief. It has had the effect of checking healthy competition in a very serious manner. As one result of these well-meant attempts, many young companies have been nipped in the bud, because they could not come up to the stringent requirements imposed. It was well known that a large new business obtained at a very great expense, does not produce sufficient cash to the companies, after payment of all expenses, to enable them to form a net premium reserve. The consequence has been that the profits of the older members have been drawn upon for that purpose. This appeared to him to be an injustice to those older members. Another effect, he believed, has been to lead the companies to push unduly their system of tontine assurances, in which they do not declare any profits for many years, and are not required to say exactly what provision they make for future profits. While he maintained the general principle that trade and commerce should be left to develop themselves unfettered by law, of course, if there are undoubted abuses, of sufficient magnitude, then the law is justified in interfering and putting a stop to them. In Great Britain, before the year 1870, there were serious abuses in the business of life assurance. Those whose memory goes back so far, are aware that between 1844 and 1870 there was an immense crop of small and weak insurance companies started. The law at that time gave the promoters of life insurance offices an advantage over the promoters of other kinds of companies; and, of course, as there

are always numerous company promoters, their energies took the direction in that epoch of starting new life insurance companies. The consequence was a large number of small companies competing against each other for business. That, no doubt, produced the good effect of making life insurance more widely known in this country; but it had the bad effect that these insurance companies indulged in excessive expenditure, and one after another they found themselves unable to continue. Then came an era of wholesale amalgamations between rotten companies. These rotten companies were united to form large companies still more rotten than the original ones, until the failure of one large company became a public scandal, and the attention of Parliament was called to the subject. Legislation became necessary, and the laws of 1870 and 1872 were passed. Those laws have had a very healthy operation, which he thought the younger generation of actuaries do not fully understand. The abuses that formerly existed have been got rid of,—that fraudulent crop of unsound companies, and those fraudulent amalgamations, where enormous sums were paid to the persons who negotiated the transfer of one rotten company to another. All transactions of that sort have now to be submitted to the light of day, and the abuses have been effectively checked. At the same time, other things were effected by the legislation. Companies were required to give particulars of their methods of conducting business, and to publish certain figures as to their business, and to state the means by which they believe they secure their permanent ability to meet their engagements. That, it seemed to him, was exactly the right course that legislation ought to adopt; and having got this information, persons interested in any company should be allowed to form their own opinion as to it. That precedent, it seemed to him, had been established nearly 150 years ago, when the Equitable Life Assurance Society applied to the Government for a charter to enable them to conduct their business. That application was considered by the Government, whose financial advisers said that the new project of insuring lives at premiums calculated according to age, the premiums being much lower than any previously in use, was such a hazardous and novel one, that they could not advise the Government to give a charter to the company. The charter was therefore refused, and ever since the Equitable has carried on business as a voluntary society without any charter. The project was by no means forbidden by the Government, but they abstained from giving their sanction and authority to it. That seemed to him the proper course for a Government to take when a new and apparently dangerous project is put forward. It is not for the Government to judge whether a new development will be a success; it is not for a Government to say whether it is wise or unwise for its subjects to enter into what the Government considers a doubtful speculation. But the Government should insist upon the public having the means of informing themselves exactly about what it is proposed to do, and a fair chance of judging whether it is likely to result in a profit or a loss. There seemed to be some idea in this country that, by the legislation of 1870, the Government endeavoured to secure the solvency of the British life offices. He thought that idea was quite a mistake, and that Government had not undertaken any task of the sort. He went further, and said that it is impossible for any Government to secure the solvency of an insurance company. It would take too long to state all the reasons for that, but an example has been furnished in this country by the failure of companies through injudicious investments. It would be out of the power of a Government to prevent that. In his opinion, Government had not attempted, and would be very unwise to attempt, to secure the solvency of British life offices. He thought that no further legislation is required in this country; the happy medium has been reached; the business is not under hampering restrictions, but we have required certain information to be furnished by the offices in a form that is accessible to all parties interested, and companies are left to develop their business in the way that seems best to them. Of late years there has been marked development in some directions that would probably not have been seen

if the Government had laid down strict rules for the conduct of the business. He was afraid the younger actuaries do not fully realize the abuses prevalent a generation ago; and in considering insurance questions when brought up for discussion, they naturally approach them from the theoretical point of view. He thought the only safe way, however, was to be guided by past experience and history. Actuaries may exercise their ingenuity in suggesting all sorts of legal enactments which they think would render the business safer, but in his opinion it is unwise to attempt anything of that sort, and no further fresh legislation is required in this country. All that companies required is to be let alone, so long as they conduct their business honestly.

M. Arthur Fontaine (France) said that M. Marie had just brought out, with great justice, how difficult it is for the assured to gauge the quality of the foundations of the assurance contract he enters into, especially in the case of life assurance. It is this difficulty of estimating the value and security of the contract which has led the State to insert in its regulations the essential actuarial basis, without which assurance is a snare, without which the assured does not receive that value which in good faith he thought he was purchasing. The State intervenes to define fraud. But how is it going to intervene to expose it?

Two methods present themselves. Either, after having laid down the essential basis, the State will content itself by requiring the companies, whether mutual or proprietary, to publish their accounts in a clear and detailed form, and thus to allow the assured, either by himself or assisted by private actuaries, to arrive at a sound opinion on the solvency of the assurer. Or, going further, the State will appoint public actuaries to verify the accounts of the assurer, ransack his books, and sift his balance-sheet. It will itself take charge of his solvency. In the first alternative, the State will have taken all the precautions in reality necessary to leave to the public the duty and means of itself defending its interests with a knowledge of the facts. In the second alternative, having audited the accounts, and having certified to those interested their correctness and their truthfulness, it will have assumed a heavy responsibility in the matter of the management of the companies, and, in the event of an important default, it will be impossible to refuse financial aid to avert a

M. Arthur Fontaine.—M. Léon Marie vient de faire ressortir avec raison combien il est délicat pour l'assuré d'apprécier la qualité des bases de l'assurance qu'il contracte, surtout dans le cas de l'assurance sur la vie. C'est cette difficulté d'apprécier la valeur et la sécurité du contrat qui a entrainé l'Etat à insérer dans des règlements les bases essentielles, scientifiques, en dehors desquelles l'assurance est un leurre, en dehors desquelles l'assuré n'a pas la valeur que, de bonne foi, il a cru acheter. L'Etat intervient pour définir la fraude. Mais comment va-t-il intervenir pour la démasquer?

Deux méthodes se présentent à lui. Ou bien, après avoir stipulé ces bases essentielles, il va se contenter d'obliger les Compagnies, mutuelles ou à primes fixes, à publier leurs comptes dans une forme claire et détaillée, et permettre ainsi à l'assuré de se faire, par lui-même ou aidé des conseils d'actuaires privés, une opinion raisonnée sur la solvabilité de l'assureur. Ou bien, allant plus loin, il va nommer des actuaires publics pour vérifier les comptes de l'assureur, dépouiller ses livres, éplucher son bilan; il va veiller lui-même à sa solvabilité. Dans le premier cas, il aura pris toutes mesures de droit nécessaires pour laisser au public le soin et la possibilité de défendre lui-même ses intérêts en connaissance de cause. Dans le second cas, ayant vérifié les comptes et certifié aux intéressés leur exactitude et leur sincérité, il aura assumé une part assez lourde de responsabilité dans la gestion des compagnies, et, en cas de déficit important, il lui sera impossible de ne pas apporter son aide financière pour parer à un désastre. Or, puisque personne n'est obligé de contracter une assurance-vie, il ne semble pas que

catastrophe. Now, as no one is obliged to effect a life assurance, it does not appear why the State should substitute its own responsibility for that of the assured, and give him a guarantee which might press heavily on the budget.

It was the first alternative which was adopted by the State in France for life companies, and it was perfected in 1894 by a series of measures relating to the publication of accounts. A Department was established with a small staff to give practical effect to it. Is the form of accounts hitherto adopted the best? That is a point which may be discussed without contravening the principle. But it appears that the State may maintain this system of control, improved if necessary, all the more because the National Fund offers a refuge to small annuitants who may be timid.

Will the State in France adopt the same measures for the companies which provide compensation to the victims of accidents, and their personal representatives, under the new law of 9 April 1898? That is not likely, for this reason: The law of 9 April 1898, imposing on the majority of manufacturers the necessity, if not the obligation, to assure, the legislature, rightly or wrongly (I do not say which), thought it a duty to declare, in Art. 26, that, in case of the failure of the assurer, the State will pay the compensation to the victims and their representatives without claiming against the manufacturer, who is liable in the first instance, and who had protected himself by an assurance. Henceforth the State has no longer to fear entering on the liability, being already liable to the utmost. It will therefore seek to diminish the risk by an inspection as rigorous as possible. Probably it will be driven to place under close control the assurance companies providing compensation for accidents.

Life assurance companies will therefore have to establish special departments if they wish to provide compensation for accidents. Otherwise it is to be feared that the more strict regulation of accident assurance would bind them hard and fast, an event to be regretted.

l'Etat doive ainsi substituer sa responsabilité propre à celle du rentier et lui donner une garantie qui pourrait peser lourdement sur le budget.

C'est le premier système qu'a adopté l'Etat français pour les compagnies d'assurances-vie; il l'a perfectionné en 1894 par une série de mesures relatives à la publication des comptes. Il a constitué un bureau, avec un personnel restreint, pour en suivre l'application. La forme des comptes adoptée jusqu' ici est-elle la meilleure? C'est un point sur lequel on peut discuter sans entamer le principe. Mais il semble que l'Etat puisse s'en tenir à ce système de contrôle, au besoin perfectionné, d'autant plus que sa Caisse nationale offre un refuge aux petits rentiers timorés.

L'Etat français adoptera-t-il la même mesure pour les compagnies qui serviront les rentes accordées aux victimes d'accident et à leurs ayants droit par la nouvelle loi du 9 Avril 1898? Ce n'est pas probable, et voici pourquoi. La loi du 9 Avril 1898 comportant pour la plupart des industriels la nécessité, sinon l'obligation, de l'assurance, le législateur, à tort ou à raison (je n'ai pas à l'apprécier), a cru devoir spécifier dans l'art. 26 que, en cas de défaillance de l'assureur, l'Etat paiera les indemnités aux victimes et à leurs ayants droit sans se retourner contre l'industriel, premier débiteur des pensions et qui s'était couvert par une assurance. Dès lors, l'Etat n'a plus à craindre d'engager sa responsabilité, elle est engagée à fond; il cherchera donc à l'atténuer par une inspection aussi rigoureuse que possible. Il est probable qu'il sera amené à mettre comme en tutelle les compagnies d'assurances servant les pensions d'accident.

Les Compagnies d'assurances-vie devront donc créer des branches spéciales, si elles veulent faire la pension d'accident; sans cela il est à craindre que la réglementation plus stricte de l'assurance accident ne vienne à les englober, ce qui serait regrettable.

Mr. GEORGE KING (London) said that they had had a large number of very interesting Papers submitted, which might be divided into two classes. Papers of one class were descriptive of the law of the individual countries to which they referred, while those of the other class dealt with general principles of law; and it was of these latter that he desired more particularly to speak.

Here, again, however, there were two sub-divisions. There was the question of the life assurance contract—the contract between the assured and the company; and there was the question of the relations between the companies and the government. Of the first of these he would not then speak. It was not of so great consequence, because, after all, a contract is a contract, and the public can make its own contracts with the companies, and there is no great necessity to have special laws on the subject of life assurance contracts, at least in this country. The contract of assurances is amply covered by the general law, and competion will prevent companies from introducing oppressive provisions.

The case is very different with the relations between the companies and the government, and there very important questions arise. In this country, fortunately, there is no burning question. Dr. Sprague has explained that we do not require any more legislation—that we have hit upon the happy mean, and can get alongvery comfortably. He (Mr. King) practically agreed with Dr. Sprague, although there were some slight modifications which he thought might usefully be introduced. We have gone upon the principal of publicity, but it is publicity of rather an ancient character, and he would like to see the accounts published very much more quickly after the dates to which they refer. He thought a great deal of the benefit of publicity was lost by the dilatoriness in publishing the accounts. That, in his opinion, was one of the most important matters to be attended to in British life assurance legislation, which shows how very little change is really required in this country.

He hoped that Mr. Barrand would not feel hurt when he said that on most of his suggestions on this point he entirely disagreed with him. Mr. Barrand, as the speaker understood, suggested that there must be compulsory annual valuations, because a company that is absolute solvent at one quinquennial valuation, might become hopelessly insolvent by the next. Mr. King asked for an example of such an event. He himself did not think it was possible, and therefore, while he did not deny the advantages of annual valuations, he strongly protested against any law imposing such a necessity upon the companies. There was no need for it.

Then Mr. Barrand seemed to strike at the very root of publicity in saying that we should get an actuary of high standing to certify the accounts: take his word for them as sufficient: and then refrain from publishing the details which would enable outside experts to verify his certificate. He (Mr. King) would like to know who is to give a certificate to the actuaries of high standing, that they are absolutely truthful and competent. Personally, no matter what actuary might be employed, and what he might say, he would like to see the figures on which his certificate was based. To abolish publicity, as Mr. Barrand proposed, by not giving details sufficent to enable an outside expert to test the figures, strikes at the very root of the principle, and he would most emphatically say that, just as you cannot make men sober or good by Act of Parliament, so you cannot keep a company solvent by Act of Parliament. There is nothing like publicity to keep men in order, and there is nothing like publicity to keep companies in order.

There was one other point to which Mr. King wished to refer, namely, a passage in the Paper submitted by M. Chas. Le Jeune, in which he had criticized some of the statements made by him (Mr. King) in a Paper on Life Life Assurance Legislation, which had appeared in the Institute Journal. M. Le Jeune took exception to the suggestion that it would be desirable for foreign companies in great Britain to retain in the hands of trustees in Great Britain the funds representing the reserves against the policies issued in Great Britain; and he seemed to think that, in making that suggestion, he (Mr. King) proposed to

give a special lien on these funds to British policyholders, and, in fact, to set up the British policyholders as a privileged class with their own funds. That was not at all his idea, because he was as strongly opposed as M. Le Jeune could be to the hypothecation of any part of the funds of a company for the benefit of any particular policyholders. He held that the funds were one and indivisible, and should be liable to all the policyholders, no matter to what country they might belong. He therefore entirely agreed with the sentiments of M. Le Jeune on this point. All policyholders should be on an equality, but if there is not a fund in Great Britain for the contracts of Great Britain, then the policyholders in Great Britain are not on an equality with the policyholders in the home country of the company. He therefore thought that there should be equality in this way—that there should be funds here, not specially hypothecated, but funds available in case of necessity arising. It is conceivable that a foreign company might contract liabilities here, and then close its agency and go home and leave us, and compel British policyholders to remit their renewal premiums abroad, or else lose the benefits of their policies. In this way, the reserves for British policies might to a large extent be confiscated, because many of the British policyholders would not know how to follow the company to its own State. Then there is another point. In the event of war, a very difficult question would arise. Of course the company's active operations would thereby be suspended, but there should be funds at hand, to enable the branch in Great Britain to be carried on for the purpose of paying claims, even in the event of war. He did not advocate the hypothecation of funds, but merely the retention of funds which would be available under all eventualities. There was a very wide distinction between the two principles.

Mr. A. H. Bailey (London) said that so much had been said upon the particular subjects to-day that he had hardly anything to add. He agreed with Mr. Blankenberg, of Holland, that we want life insurance contracts as unfettered as possible, but it is not quite right to say that we, in this country, are entirely free in that respect. Take one absurdity under our present law. A creditor may insure the life of his debtor, but his interest is then only in the death of his debtor rather than in his life, while a widow, who may be dependent upon her son, may not by law, insure her son's life. He thought, therefore, it was very desirable that that anomaly should be removed. He agreed almost entirely with what Dr. Sprague had said, except that he thought the Act of 1870 requires a little amplification. He thought that the assets of the companies should be divided simply into investments and loans in the most comprehensive sense of the term, and in that way he thought the balance-sheets would be improved. As regards the notion that the assured themselves derive anything from this publicity, he ventured to say that the ordinary mortal never does understand a life insurance valuation, and never will; but still, the publicity given has done good.

The Chairman (Mr. Manly) said that he hoped that before the proceedings closed, some champion of restrictive legislation and Government interference in the conduct of life assurance would speak. So far there had been a rather one-sided debate. He invited Mr. W. D. Whiting, of New York, to give his views.

Mr. Whiting (America) said he represented that portion of the American system which has to do with the supervision of insurance, and he was agreeably surprised to find that, after all, it was not the question of State supervision which was debated, but really the question of how large a degree of State supervision there should be. He had expected to find the lion on one side and on the other side the British sheep; but instead of that he found a quiet discussion of the details of State supervision as to how much is desirable. The question was a most interesting one, and it seemed to him that the tide of State supervision was rising all round the world. There was more and more of it, not less and less of it, and he thought they might well pause to ask what is the occasion of this phenomena. It occurred to him that the great importance of life insurance as an economic factor, one which

goes into every home, and performs such great public functions, coupled with its highly technical character, making it difficult for the public to understand, and, too frequently, difficult for the managers themselves, together with the great opportunities for fraud which that state of affairs promotes, and the enormously bad effect of such frauds; that those were the factors which, by a concensus of opinion in all nations, were gradually making towards severer restrictions. He thought that the various points in State supervision might be divided in this way: First, publicity—and upon that, happily, all are agreed; but the question was, what is meant by publicity? Is it merely the filing of a report or some particular part of a report—sometimes once in five, and sometimes one in ten, years; and which is often delayed in such a manner that the information has actually become stale? Is that publicity? From an American point of view it is not. The statements there are published early in the spring, relating to December 31 preceding; and they actually calculated the reserves of the companies according to a fixed basis, from which estimates might be derived of the reserves upon any other basis. A statement was required which had been accused of a great deal of impertinence in its analysis, but it brings out all the facts. Do the American stop there? Certainly not. If they did he would think that the system was absolutely incomplete. They ask for the assets of the companies; they ask for the liabilities; they ask for the income and for the disbursements. But it might be asked, how is it to be known, when a statement is rendered to the State Department, that it is correct? There is no intelligent way, it seemed to him, of ascertaining the facts except by having the privilege of examination. Human nature may be different in different parts of the world. In America they had had, unfortunately, to deal with a great deal of fraud, and it is as much in the interest of the honestly-managed company that the closest scrutiny of the office should take place as of anybody else. Now, there was another difficulty in connection with this question of insurance. It is not always undertaken by persons of intelligence, even if their integrity be admitted. Most of the failures with which we had come into contact, had been those caused by the want of capacity of the directors or managers. Now, shall it be said that the State shall take no part in the protection of the policyholders in relation to that management, but shall leave the matter absolutely open until disaster shall take place?—shall they make no sort of discrimination as to what sort of investments a company shall undertake?—shall all that be left entirely open? It would not do in America. It might do here. Human nature may be differently constituted in different places, but he was sure that if there were no restrictions in America, very quickly advantage would be taken to get possession of large companies for the purpose of acquiring their assets, and to exploit certain operations. In fact, such schemes have been undertaken, as is well known to American actuaries, so that perhaps the system there has grown up by reason of the local surroundings, and that we are not, perhaps, in a position to criticize or judge of the necessities of one another's countries in this respect. One abuse which has grown up in relation to this matter of State supervision is taxation, and he was inclined to think that perhaps some of the acceleration of State supervision had taken place from the disposition of the State to acquire revenues from that source. That was wholly unjustifiable. As far as the supervisory boards of the United States are concerned, on the question of taxation they are uniformly opposed to higher taxation. They had done something, although perhaps not as much as they might have done, towards the repression of bad legislation, but it was entirely impossible for him to enlarge on this head in the few moments allowed him. He hoped that the time was not far distant when the Congress would visit America, and there study the institution of State supervision at the fountain head.

Mr. Emory McClintock (America) had little to add to what had been said by Mr. Whiting, and he thought the Americans present would all agree with what Mr. Whiting had said concerning supervision in the United States. He

(Mr. McClintock) stated personally to the Congress at Brussels, just as Mr. Whiting had done, that the influence of the Commissioners had been on the whole towards the repression of bad legislation. The examinations made by the Commissioners into the affairs of a company in reality had the effect of increasing the publicity, which they all agreed was what was needed in connection with supervision. On the other hand, there was a matter which Mr. Whiting did not touch on particularly; and he would add that the State supervision of the United States had many small inconveniences, arising from the great number of departments—one department for each State. That notwithstanding all the tendencies there may be towards individual diversity in this direction or that, in one State or the other, the natural effect thus far was that supervision consisted almost entirely in producing uniformity and publicity of accounts. It had had exceedingly little to do with the nature of the contracts made, in the way of interfering with such contracts, and where such interference had been attempted it was recognized generally to have been mischievous. There was another subject touched on by Mr. King. He (Mr. McClintock) did not dispute the possible advantages, for instance, to the English policyholders of an Australian company which might come here to do business, of requiring such a company to invest the reserves on English policies in English securities.

Mr. King: In any securities whatever placed in the hands of English trustees.

Mr. McClintock, resuming, said that made a difference. At the same time, the placing of securities in the hands of trustees was a matter which tended to hamper investments. If an Australian company could invest on mortgage at 5 per-cent, if these mortgages had to be sent over here to be placed in the hands of English trustees, the rate of interest must necessarily be reduced at least one-half per-cent. He thought every one would agree with him that it was easier to get a good rate of interest when every facility was afforded to the borrower of paying back his loan when he thought fit to do so. That was customary in America. There were few large companies which would refuse to permit part of the loans to be repaid after a certain time, and if certain mortgages were placed in the hands of trustees as far away as Australia was from England, the difficulty would be increased and the rate of interest reduced. There were other things which would occur to them as tending to hamper and clog the work of investment if investments had to be sent many miles away to be placed in the hands of trustees.

Mr. Manly said they had had a valuable collection of Papers that day upon a very important subject, followed by an interesting and valuable discussion, which they would all read with the greatest interest when published in the Transactions of the Congress. He thought the discussion that day was evidence of the great value of a Congress like theirs.

The Congress adjourned.

Les Sociétés de Secours mutuels en Belgique envisagées au point de vue actuariel.

PAR L. DUBOISDENGHIEN,

Secrétaire de l'Association des Actuaires Belges, Membre correspondant de l'Institut des Actuaires Français, Trésorier du Comité Permanent des Congrès Internationaux d'Actuaires.

La loi belge du 23 juin 1894 portant révision de la loi du 3 avril 1851 sur les sociétés mutualistes envisage, entre autres, les associations dont le but est *d'assurer* aux sociétaires des secours temporaires en cas de maladie et de pourvoir aux frais funéraires.

Nous bornerons notre examen aux sociétés ainsi définies, c'est-à dire à celles qui ont pour objet essentiel *l'assurance* contre le risque de maladie et contre le risque de décès.

Ces sociétés sont divisées, en Belgique, en deux catégories : les sociétés *reconnues* et les sociétés *non reconnues*.

Les sociétés reconnues jouissent de la personnification civile dans les limites et sous les conditions déterminées par la loi (art. 7).

Elles jouissent de prérogatives spéciales, énumérées à l'art. 8 de la loi : elles sont exemptes de certains droits de timbre, leurs publications sont insérées gratuitement au *Moniteur*, et la franchise postale peut leur être accordée.

Les membres de ces sociétés ne sont responsables que jusqu'à concurrence de leurs engagements à l'égard de la société, à défaut de dispositions contenues dans les statuts (art. 7).

L'article 5 est ainsi conçu : " La société mutualiste qui désire être " reconnue adresse sa demande au Gouverneur de la province où se " trouve son siége social ; elle y joint deux exemplaires de ses statuts, " ainsi qu'une liste de ses administrateurs ou de ses fondateurs.

" Dans le mois, le Gouverneur transmet la demande avec un avis " motivé à la Commission permanente des sociétés mutualistes.

" Celle-ci fait rapport au Gouvernement après s'être directement " mise en relation, s'il y a lieu, avec la société et avec le Comité de " patronage dans le ressort duquel la société a son siége.

" Dans un délai de quatre mois à partir de la demande, le

" Gouvernement notifie à la société la décision motivée par laquelle il " la reconnaît ou lui refuse la reconnaissance."

Les sociétés non reconnues ne jouissent pas de la personnification civile et fonctionnent en pleine liberté.

Au 31 décembre 1895, il y avait en Belgique 752 sociétés reconnues, comprenant 97,591 membres effectifs, et possédant un actif total de fr. 3,726,497.

Il y avait, à la même date, environ 176 sociétés non reconnues comprenant environ 35,732 membres effectifs, et possédant approximativement un actif total de fr. 928,109.

Quant au *passif* des sociétés en question, il n'a jamais été soumis à une évaluation quelconque.

Les rapports périodiques de la Commission Permanente des sociétés mutualistes contiennent des indications détaillées au sujet de la situation active des sociétés à la fin de chaque année.

Il nous a paru intéressant de grouper ces renseignements de façon que l'on puisse se rendre compte de la marche des sociétés les plus importantes de trois provinces : une province flamande, *Anvers* ; une province wallonne, le *Hainaut* ; et une province mixte, le *Brabant*.

Le tableau ci-après donne des indications pour les années successives comprises entre 1880 et 1895 inclus, c'est-à-dire pour une période de 16 ans. Nous avons circonscrit cette statistique aux seules sociétés *reconnues* qui, pendant la période envisagée, ont atteint un chiffre de 200 membres effectifs au moins, et qui ont été reconnues avant 1891.

Dans ce tableau, H signifie : nombre de membres honoraires ;
E ,, : ,, ,, ,, effectifs ;
RO ,, : montant des recettes ordinaires ;
DO ,, : ,, ,, dépenses ordinaires ;
RE ,, : ,, ,, recettes extraordinaires ;
DE ,, : ,, ,, dépenses extraordinaires ;
A ,, : actif total.

Les membres honoraires (H) ne participent pas aux avantages de la Société ; ce sont des personnes dont le rôle est restreint à une intervention morale et pécuniaire.

Les membres effectifs (E) retirent un avantage direct de leur participation ; ce sont les *assurés*.

Les recettes ordinaires (RO) comprennent les cotisations, les droits d'entrée, les intérêts des fonds placés, les amendes.

Les dépenses ordinaires (DO) comprennent les indemnités pécuniaires, les frais médicaux et pharmaceutiques, les frais de funérailles et les frais divers.

Les recettes extraordinaires (RE) se composent des contributions des membres honoraires et de toutes les ressources extra-sociales, dons, legs, subsides, produits de fêtes, &c. Par essence, elles doivent être utilisées en dehors du but principal de la société, en faveur des membres qui ont épuisé leurs droits aux secours ordinaires, pour venir en aide aux veuves ou orphelins de membres décédés, &c.

Les dépenses extraordinaires (DE) comprennent les secours extraordinaires, les indemnités aux veuves et orphelins, &c.

Enfin, l'actif (A) représente l'avoir total de la société.

Tous les nombres du tableau ci-après sont extraits des rapports de la Commission Permanente des sociétés mutualistes de Belgique ; nous nous sommes borné à grouper ces nombres.

TABLEAU DE LA SITUATION ACTIVE, DE 1880 À 1895, DES SOCIÉTÉS DE SECOURS MUTUELS, RECONNUES AVANT 1891, DES PROVINCES D'ANVERS, DE BRABANT ET DE HAINAUT, DONT LE NOMBRE DE MEMBRES EFFECTIFS A ATTEINT 200 MEMBRES AU MOINS PENDANT CETTE PÉRIODE.

Sociétés (Année de la reconnaissance légale)	—	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895
"Société Royale des Sauveteurs de Belgique," à Anvers. (1871)	H	118	82	82	79	82	39	30	31	28	30	30	29	32	35	33	36
	E	236	229	224	227	205	156	152	173	176	170	190	171	181	174	169	171
	RO	1677	1464	1453	1348	1798	1890	2152	2216	2362	2541	2572	2398	2685	2454	2441	2219
	DO	2748	2405	2481	2419	2585	2107	2760	2190	2753	3681	2703	2803	1927	2364	3584	3043
	RE	1734	951	712	681	724	505	688	377	322	387	340	370	465	405	385	380
	DE	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	A	8978	8990	8674	8284	8221	8508	8588	8991	8922	8169	8378	8343	9567	10062	9304	8860
Société "De Vereenigde Ambachts en Werklieden," à Niel. (1872)	H	...	...	...	...	...	...	35	31	30	28	25	22	16	16	16	14
	E	366	370	365	359	355	340	343	329	362	410	411	418	426	432	433	434
	RO	3384	3393	3582	3289	3260	3133	3068	3049	3378	3682	3790	3795	3856	3900	3846	3931
	DO	3369	3223	3514	3070	3314	3628	3590	2945	3426	3359	3663	4076	4587	3993	4215	5036
	RE	...	216	...	...	...	...	557	213	204	299	215	180	449	399	320	581
	DE	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	A	*Déficit* 530	*Déficit* 144	*Déficit* 76	143	89	*Déficit* 406	*Déficit* 372	*Déficit* 55	101	722	1073	972	690	998	948	425
Société "Saint Joseph," à Malines. (1852)	H	32	24	23	23	22	25	28	23	31	20	15	15	15	15	16	18
	E	306	296	298	289	266	255	214	190	166	152	149	119	126	73	71	68
	RO	4493	4510	4386	4276	4173	4030	3779	3157	3115	2262	2166	1771	1404	1539	1014	1039
	DO	5049	5634	5798	4959	4315	5191	4502	3672	4632	4306	3737	3572	3172	2304	2834	2475
	RE	839	814	800	793	914	811	823	803	764	1231	1163	1087	966	950	1647	1076
	DE	526	408	703	...	585	500	546	246	...	3229	57	...	...	...	...	...
	A	13476	12759	12717	12717	12717	12717	12717	12231	12735	6940	6476	5762	4960	5145	4973	4614
Société "La Prévoyance," à Anvers. (1882)	H	...	...	...	...	...	...	...	...	2	...	2	2	2	3	3	1
	E	...	...	480	500	729	784	795	820	975	1004	1033	1026	955	1003	1023	1007
	RO	...	...	2027	2172	2774	3443	3472	3728	4452	4396	4705	4515	4501	4411	4431	4459
	DO	...	...	44	55	52	87	84	1222	3673	96	4273	4732	3594	150	3489	3351
	RE	...	...	1615	50	...	...	...	...	...	...	5	10	38	18	43	280
	DE	...	...	1315	353	2161	2267	2331	...	...	2940	...	...	...	...	...	...
	A	...	...	2288	4097	4658	5747	6805	9311	10089	11450	11887	11680	12624	11129	12115	13502
Société "De Vereenigde Werklieden der Bell Telephone Mfng Cie," à Anvers. (1890)	H	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	E	...	...	...	...	...	...	...	...	...	...	160	463	227	215	225	251
	RO	...	...	...	...	...	...	...	...	...	...	934	1628	2308	1085	1302	1538
	DO	...	...	...	...	...	...	...	...	...	...	865	1092	1595	742	754	1414
	RE	...	...	...	...	...	...	...	...	..	...	392	781	1242	...	5	...
	DE	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	A	...	...	...	...	...	...	...	...	...	...	1189	2506	3281	3625	4177	4301

Société "Les Compagnons Bronziers," à Bruxelles. (1873)	H	4	4	3	...	...	...	...	...	...	...	6	6	7	6	6	6
	E	140	143	145	150	153	158	190	205	232	229	239	244	250	258	249	246
	RO	4053	3394	3118	3207	2769	3590	4730	3919	3818	4027	4334	5144	6235	6100	4831	5085
	DO	3652	2379	2324	2450	2035	2933	2846	3302	3989	4382	6804	6367	6761	9285	4955	5347
	RE	660	660	646	...	100	...	...	691	1584	1635	2069	3528	1801	3344	600	1060
	DE	945	268	...	225	130	522	780	...	680	747	1125	1266	1717	1656	600	1000
	A	19019	20427	21867	8350	9054	9189	10293	11601	12335	12867	11341	32921	32479	30982	8054	7852
Société "La Fraternité," à Ixelles. (1869)	H	13	12	8	8	8	18	60	65	69	83	86	89	80	72	80	80
	E	57	55	60	65	96	117	162	179	202	229	250	282	330	378	420	425
	RO	1130	1283	1271	1408	1321	1668	2511	2758	3021	3617	3768	4490	5532	7049	7598	8641
	DO	997	1786	790	1194	1649	1833	2635	1957	1966	2673	3826	4353	6011	8263	7926	12364
	RE	84	111	218	71	387	1031	571	749	1206	1191	1525	1933	2260	1969	4129	5348
	DE	...	300	...	100	...	300	350	525	225	225	220	914	805	588	1119	1625
	A	4688	4196	4895	5080	5270	6030	6127	6911	8948	10857	12103	13260	14237	14404	17086	17086
Société "Steunstok der Werklieden," à Vilvorde. (1873)	H	18	22	22	18	29	25	27	29	33	44	49	54	65	61	72	77
	E	164	195	211	195	168	146	140	129	126	125	125	128	135	138	148	172
	RO	2125	2388	2672	2699	2454	2151	2083	2027	1983	1838	1805	1946	1922	2043	2168	2629
	DO	2608	2370	3542	2815	3664	1492	2494	1921	2021	1817	2255	2065	2209	2794	1780	3026
	RE	300	275	216	108	811	373	1215	516	901	1095	835	783	1113	869	1982	1420
	DE	15	...	...	...	...	...	700	100	500	200	200	100	300	100	...	200
	A	6086	6380	5725	5717	4864	5897	6001	6523	6886	7802	7986	8550	9077	9095	11467	12290
Société "Hulp en Onderstand," à Louvain. (1865)	H	54	52	52	48	42	38	36	38	37	39	41	38	35	42	34	37
	E	230	218	206	208	194	189	185	232	234	243	238	227	225	211	171	174
	RO	1833	1773	2068	1916	1790	1777	1503	1799	1589	1726	2004	1761	1845	1775	1482	1801
	DO	2214	2063	2555	2885	2212	1954	2035	1141	1958	2425	3058	2888	2871	2434	2522	2507
	RE	515	308	360	509	533	365	304	1218	214	606	686	302	361	702	761	813
	DE	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	A	5157	5175	5047	4587	4698	5186	4958	6534	6379	6286	5918	5093	4428	4472	4475	4581
Société dite "Caisse de Prévoyance de Bruxelles et communes limitrophes," à Bruxelles. (1854)	H	88	81	71	68	64	61	52	72	64	60	60	65	63	63	59	57
	E	479	462	442	415	400	390	379	387	405	414	430	469	516	562	2163	2316
	RO	9604	9471	9187	8734	8447	8315	8025	8454	9841	10013	10770	10707	11131	13445	15012	16745
	DO	11226	11320	10698	10973	10484	10461	9874	11416	10980	9976	12268	11651	14896	17816	23350	23128
	RE	1711	1607	1382	1287	1254	1274	1157	4220	7242	4690	6497	5591	4969	6496	9150	9429
	DE	30	10	20	60	...	30	20	...	1051	547	722	1694	2168	1880	2017	2271
	A	15772	15520	15372	14360	13576	12674	11963	13220	18272	25837	30114	33067	32124	32370	31164	31940
Société "Les Jeunes Abeilles," à Bruxelles. (1860)	H	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	E	213	216	210	206	206	203	204	210	202	204	201	202	170	160	160	150
	RO	5226	4701	5151	4544	4415	4741	5268	4254	4798	4692	4111	4900	5161	4493	4658	4407
	DO	4840	4285	3169	3565	3991	5038	4625	4064	7126	5339	6710	6336	5161	5204	5391	6875
	RE	563	400	375	200	948	905	473	1804	2527	1732	2570	2122	2005	1204	1919	2401
	DE	1216	1027	1195	750	265	1150	650	771	1681	1030	1202	2174	1428	1445	928	610
	A	11842	11631	12793	13222	14330	13788	16399	18314	16832	17043	15763	14493	14626	13674	13488	12810

TABLEAU DE LA SITUATION ACTIVE, DE 1880 À 1895—*suite.*

Sociétés. (Année de la reconnaissance légale)	—	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895
"Société Royale et Centrale des Sauveteurs de Belgique," à Bruxelles. (1869)	H	640	750	987	897	1022	300	747	806	909	1037	641	718	939	1029	1137	1460
	E	838	976	1906	1975	2172	2541	1888	2059	2154	2543	3724	2047	2072	2098	2588	2396
	RO	8820	8223	12442	16058	16149	16230	24995	24141	23435	23037	24035	24491	24086	24924	26151	26653
	DO	12962	11505	19442	20306	21203	21014	41549	33626	26519	25996	33209	33268	31611	32163	36400	39693
	RE	3233	4049	5713	7016	11497	4330	14423	5660	6292	6032	5945	10916	8820	7356	9408	12747
	DE	...	70	...	110	25	...	50	591	35	326	200	255	165	80	29	189
	A	19650	20347	19022	21681	28099	27644	24025	19609	22781	26005	22575	24459	25590	25628	24758	24275
Société "La Fraternelle Belge," à Bruxelles. (1877)	H	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	E	560	548	561	567	588	600	666	693	714	746	797	844	925	972	997	1062
	RO	20363	19744	20108	20809	21930	22502	25329	27028	26167	26684	29010	30678	32885	34846	35101	37727
	DO	15834	14157	11013	12506	12985	14815	21292	20368	21460	25066	26592	26995	35099	34567	40750	43433
	RE	...	30	50	200	150	300	400	2667	4008	6063	4272	2907	3112	5974	11094	9707
	DE	1450	1490	1300	1950	2787	2958	3702	4589	4630	5049	5009	4749	4115	3940	4305	4746
	A	61960	62303	70148	80486	86793	91823	92557	97404	101489	104121	105804	107644	104417	106730	107870	107125
Société "La Mutualité Commerciale," à Bruxelles. (1877)	H	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	E	1005	1003	1014	1017	1000	970	1025	1002	1063	1072	1067	1043	1022	965	906	863
	RO	30613	30134	31657	31835	30605	29814	41562	30729	37237	35963	35986	35726	34697	32968	31245	29371
	DO	27679	27576	26277	29189	28695	29394	30999	32084	35095	41349	37320	38940	44411	41538	30059	28469
	RE	2000	200	1710	200	268	200	200	310	596	2828	4735	6257	1701	6291	4947	2602
	DE	2230	2870	2770	4675	4555	3655	3755	4115	1990	1705	2100	2385	1995	1818	480	380
	A	92314	93447	97767	95938	93036	90000	98120	92959	93708	89445	90747	92590	82582	85062	80572	83697
Société "De Voorzienigheid," à Louvain. (1879)	H	100	100	89	89	78	75	77	75	73	70	68	60	61	58	55	58
	E	796	775	784	776	801	817	803	764	723	714	722	684	602	563	513	462
	RO	9405	9049	9245	9171	9616	9584	9513	9324	8705	8563	8770	8394	7349	6926	6361	5869
	DO	9850	7983	9477	8543	10003	11634	9520	8656	10031	8374	9938	9651	9269	8458	7878	7681
	RE	2628	2529	2493	900	800	775	770	2226	706	1645	2055	2908	1105	1704	2071	5197
	DE	1628	1529	1593	...	...	...	40	797	50	820	1933	2065	662	1119	713	528
	A	16933	18999	19675	21203	21615	20340	21063	23160	22491	23504	22458	22044	20567	19619	19460	22317
"Société établie entre les ouvriers des ateliers de MM. A. et E. Gilain," à Tirlemont. (1860)	H	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	E	266	248	265	265	262	257	257	254	262	300	298	334	321	335	338	253
	RO	8320	7736	7863	7467	8265	7641	7935	8429	8006	076	8743	8587	9205	9415	10947	9323
	DO	6332	4752	2993	4696	6317	3901	3627	4044	5962	5012	6342	6784	5772	4381	4940	5606
	RE	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1300	1350
	DE	2642	4584	4358	3840	3974	2970	3800	4137	3727	3465	3742	4377	4401	4641	4619	6057
	A	15752	15152	16665	16596	15570	17340	18848	20097	19414	20613	19672	18098	18131	19524	22212	21222
Société "St. Michel," à Nivelles. (1868)	H	31	31	31	31	29	28	27	23	23	18	23	21	25	28	27	30
	E	218	222	217	219	245	244	249	252	271	268	275	283	278	284	332	368
	RO	3075	3011	3219	3102	3251	3404	3537	3693	3667	3600	3690	3655	4110	4259	4390	4821
	DO	2990	3620	4192	3845	4028	4423	4968	4358	4379	4744	4572	5140	4960	5712	4805	5634
	RE	1213	1252	1273	1185	1276	1132	1122	2151	1308	969	984	742	1077	960	1958	1326
	DE	225	45	569	350	100	100	590	510	310	175	100	130	300	250	15	1145
	A	10376	10974	10705	10798	11197	11209	10210	11187	11474	11124	11126	10253	10179	9435	10964	10333

Société "Les Anciens Frères d'Armes," à Bruxelles. (1888)	H	...	...	...	...	...	...	...	...	...	18	36	32	39	Inconnu	Inconnu	58
	E	...	...	...	...	...	...	...	...	348	275	314	468	426			480
	RO	...	...	...	...	...	...	...	...	1248	3266	1128	7041	1856			13368
	DO	...	...	...	...	...	...	...	...	758	2028	751	7317	2560			14107
	RE	...	...	...	...	...	...	...	...	...	155	500	1079	3623			1620
	DE	...	...	...	...	...	...	...	...	...	...	...	100	...			545
	A	...	...	...	...	...	...	...	...	490	1883	931	4119	4101			10314
Société "La Prévoyance," à Laeken. (1881)	H	...	19	20	25	22	22	22	23	22	21	21	16	18	16	14	11
	E	...	52	118	127	133	135	133	178	206	246	237	239	230	235	240	212
	RO	...	803	1646	2094	2388	2552	2317	2326	2743	3428	4133	4273	4230	4015	4544	4802
	DO	...	370	1077	2156	3334	2442	2449	2358	2762	4666	5659	4214	4614	3974	4848	4417
	RE	...	684	512	441	322	541	522	540	540	799	1848	866	891	625	1642	1021
	DE	...	...	...	17	...	100	120	60	30	...	300	450	168	450	750	750
	A	...	1902	2983	3346	2722	3286	3557	4005	4495	4056	4079	4554	4893	5109	5696	6353
Société "Les Amis Israëlites," à Bruxelles. (1888)	H	...	...	...	...	...	...	...	...	7	18	25	14	6	7	9	13
	E	...	...	...	...	...	...	...	...	397	461	305	357	265	383	245	223
	RO	...	...	...	...	...	...	...	...	5096	4540	4138	5295	3542	3196	3156	3576
	DO	...	...	...	...	...	...	...	...	4968	4500	4406	5165	4569	4403	4620	6311
	RE	...	...	...	...	...	...	...	...	284	165	300	232	48	1919	96	156
	DE	...	...	...	...	...	...	...	...	...	...	...	...	829	...	...	...
	A	...	...	...	...	...	...	...	...	3012	3517	3550	3911	2103	2815	1447	*Déficit* 1132
Société "Les Ouvriers d'Uccle," à Uccle. (1875)	H	21	22	21	18	18	19	20	17	25	28	31	44	44	54	53	59
	E	93	91	95	92	105	117	125	136	150	158	161	183	211	227	234	230
	RO	1345	1326	1333	1357	1490	1652	1787	2023	2309	2435	2464	2538	2829	3236	3467	3185
	DO	1767	1049	1851	1118	1432	2038	1883	1878	1999	2672	2661	3426	3177	4402	4703	3393
	RE	598	391	327	326	362	277	285	185	680	727	872	1359	1660	1722	2231	2497
	DE	88	...	...	...	...	...	...	...	270	307	445	324	435	421	1071	1074
	A	2706	3373	3182	3747	4167	4058	4248	4578	5299	5483	5712	5858	6735	6871	6794	8009
Société "L'Union," à Laeken. (1887)	H	...	...	...	...	...	...	...	29	34	30	26	29	26	22	12	10
	E	...	...	...	...	...	...	...	130	117	113	158	171	205	227	219	220
	RO	...	...	...	...	...	...	...	1563	1597	1541	2285	2269	3242	3916	3757	3117
	DO	...	...	...	...	...	...	...	1166	2005	1537	2699	2564	4604	4075	4292	3955
	RE	...	...	...	...	...	...	...	414	801	435	1791	846	1232	797	682	744
	DE	...	...	...	...	...	...	...	48	100	...	100	100	200	540	300	450
	A	...	...	...	...	...	...	...	1927	2326	2847	4098	4549	4220	4319	4165	4021
Société "L'Union Fraternelle," à Molenbeek-St.-Jean. (1875).	H	...	1	...	...	...	...	3	3	2	2	2	2	2	1	1	1
	E	117	129	131	136	143	149	149	151	148	150	148	149	170	191	200	216
	RO	2055	2264	2454	2425	2394	2842	2981	2931	2851	3143	3294	2665	3365	4113	4884	4256
	DO	1401	1851	1373	2480	2896	2935	2026	2961	3648	2020	2981	1902	3530	4011	4198	3618
	RE	111	164	109	...	150	124	112	186	756	336	274	852	244	112	212	924
	DE	211	364	209	100	...	300	...	100	900	400	700	300	300	456	200	44
	A	3369	3581	4561	4407	4055	3898	4966	5021	4079	5138	5025	6340	6170	5878	6576	8093

TABLEAU DE LA SITUATION ACTIVE, DE 1880 À 1895—*suite*.

Sociétés. (Année de la reconnaissance légale)	—	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895
Société "Le Progrès," à Molenbeek-St.-Jean. (1881)	H	...	...	2	1	1	...	1	1	...	...	...	...	...	...	...	...
	E	...	120	144	135	126	109	111	113	110	112	108	106	106	117	117	397
	RO	...	1680	2152	2324	2459	1951	2060	2120	1667	1584	1725	1850	1850	2221	2475	2022
	DO	...	1146	1779	2279	2667	2438	2637	2431	3453	2309	2039	2574	2574	3182	3263	3662
	RE	...	204	1231	347	682	1251	278	861	1247	975	1510	1122	1122	1101	1939	2028
	DE	...	...	273	100	268	427	142	457	349	137	417	108	108	170	446	207
	A	...	2282	3613	3904	4110	4447	3946	4050	3162	3275	4054	4344	4344	4907	5612	5793
Société "La Fraternelle Prévoyante," à Jemappes. (1879)	H	26	26	26	29	14	22	18	20	28	29	30	25	23	25	24	31
	E	255	326	456	530	604	418	356	458	512	412	380	320	360	351	401	364
	RO	3401	5240	6527	8769	8983	7418	6241	7026	9416	7606	5878	5401	5247	5706	6233	6304
	DO	2624	3239	3751	5038	5721	6333	5391	3979	6527	5392	3894	3258	4098	4583	4550	5092
	RE	285	222	3699	240	120	192	132	225	192	198	254	174	156	180	418	210
	DE	1061	1035	1253	1809	1343	2745	3112	3078	2992	3544	3870	2252	1612	1612	2098	2287
	A	10000	11187	16410	18572	20610	19142	17013	17207	17295	16162	14527	14591	14284	13974	13976	13111
Société "La Fraternelle," à Féluy. (1880)	H	5	5	5	5	5	4	4	4	3	3	3	3	3	3	3	3
	E	208	186	194	176	173	175	160	145	129	128	129	140	143	136	124	126
	RO	3935	3618	3622	3528	3344	3287	3066	2837	2536	2497	2507	2615	2744	2734	2470	2253
	DO	2584	3666	3023	4016	3625	2980	2842	3139	2586	1932	2175	2066	2459	2880	2292	2446
	RE	1118	402	100	100	100	...	...	...	...	...	50	...	120	...	...	...
	DE	...	...	...	...	...	...	...	...	...	...	...	...	75	...	...	...
	A	2530	2883	3582	3194	3013	3319	3543	3241	3190	3755	4138	4686	5017	4870	5048	4856
Société "Ste. Barbe," à Strépy-Bracquegnies. (1875)	H	15	14	9	9	10	10	10	10	16	17	10	...	...	...	44	...
	E	221	236	327	342	341	331	381	383	397	410	420	419	408	406	336	365
	RO	4261	4414	5227	6238	6000	6030	7141	7143	6840	7320	7833	7804	7909	7401	7203	6970
	DO	4126	4382	3432	4560	5709	6881	7434	7171	5625	6839	5844	7562	8888	8427	7799	7296
	RE	155	188	163	203	260	162	281	503	678	857	1051	1123	1204	1051	1121	1158
	DE	10	8	...	...	10	6	30	36	48	635	279	175	666	680	693	750
	A	2234	2446	4404	6285	6826	6131	6089	6528	8372	9075	13710	14772	14330	13675	13506	13587
Société "St. Quentin," à Péruwelz. (1858)	H	43	39	40	40	37	33	31	30	27	25	36	38	36	37	35	33
	E	219	213	197	193	196	193	191	180	186	189	107	188	185	187	184	190
	RO	1990	1830	1709	1658	1657	1669	1635	1533	1566	1570	1644	1665	1628	1540	1502	1523
	DO	2721	2941	2572	2275	2131	1900	2216	1738	2183	1454	1845	2298	2317	2265	2422	2162
	RE	883	834	340	890	322	298	286	480	962	250	366	328	566	372	760	298
	DE	...	...	...	60	96	91	168	254	269	269	319	302	336	274	358	302
	A	7192	6915	6391	6605	6357	6333	5869	5890	5966	6064	5910	5302	4843	4215	3701	3058

"Association Philanthropique," à Tournai. (1861)	H	27	23	22	19	15	12	10	10	8	8	7	6	6	5	5	4
	E	260	271	273	263	279	296	301	304	309	308	315	336	356	368	369	396
	RO	3047	3288	3644	3485	3633	3787	3893	3745	3984	3837	3605	3963	4045	4202	4411	4476
	DO	1806	2587	3498	1860	3413	3205	2948	3007	2655	2828	3412	3448	3738	3648	3667	3690
	RE	257	137	137	110	85	70	55	155	40	40	35	130	155	175	25	20
	DE	290	440	470	290	320	320	380	435	460	539	610	520	640	555	676	647
	A	24329	24727	24540	25985	25970	26301	26921	27379	28288	28799	28417	28544	28366	28540	28632	28795
"Société de Secours Mutuels établie à Beloeil." (1877)	H	14	14	13	12	12	12	...	11								
	E	189	200	187	182	187	200	161	170								
	RO	1124	1048	1116	1113	1144	1098	1015	1002								
	DO	1750	1396	1538	1745	1799	1838	1752	1393	Disparaît							
	RE	333	1046	526	610	308	319	...	295								
	DE	...	...	...	...	...	...	...	...								
	A	2733	3431	3535	3614	3267	2849	2111	2016								
Société "Ste. Barbe," à Houdeng-Goegnies. (1876)	H	11	11	16	13	16	15	11	15	16	15	12	7	8	8	5	...
	E	60	100	220	240	217	220	225	225	190	190	180	176	195	197	179	153
	RO	790	1411	2925	4155	3839	3713	3714	3742	3512	3516	3284	3347	3765	3787	3621	3300
	DO	1008	1468	2133	4277	4193	3134	3367	3750	3096	2923	3209	2978	4006	3505	3674	3633
	RE	273	287	404	240	439	314	231	401	509	186	273	277	410	322	269	330
	DE	...	35	24	35	10	24	156	144	210	92	198	285	265	300	300	260
	A	820	1025	2197	2281	2362	3232	3655	3903	4617	5304	5454	5816	5719	6023	5939	5657
Société "Les Travailleurs Athois," à Ath. (1884)	H	...	...	...	...	66	65	83	82	102	102	102	97	92	98	96	95
	E	...	...	...	...	292	301	310	271	273	215	240	251	301	318	362	356
	RO	...	...	...	...	2457	3616	3811	3619	2855	2805	3123	3354	4021	4529	5030	5395
	DO	...	...	...	...	3959	4042	3535	3730	2575	2990	3197	3971	4288	5035	4549	5697
	RE	...	...	...	...	394	375	5136	569	536	515	572	527	1466	504	501	518
	DE	...	...	...	...	...	...	...	...	...	...	...	...	150	95	120	375
	A	...	...	...	...	578	564	5976	6434	7251	7581	8079	8890	9938	9842	10704	10545
Société "Les Disciples de St. Eloy," à Mont-sur-Marchienne. (1874)	H	...	...	...	27	20	27	29	19	22	19	23	25	18	18	14	14
	E	124	136	168	187	197	202	225	245	227	310	374	389	393	407	444	496
	RO	1547	1799	2207	2547	2753	2950	3419	3419	3839	4953	7949	6665	6929	7005	7722	8268
	DO	1304	1678	2290	2107	2734	3941	4134	4159	3241	4556	7130	6829	9283	7821	6657	10780
	RE	20	...	138	244	308	411	7065	476	1255	463	1699	854	1957	1054	2081	2143
	DE	...	...	...	...	...	...	...	...	407	168	2011	598	188	441	332	526
	A	1027	1179	1202	1887	2214	2034	8384	8121	9567	10258	10766	11431	10857	11463	14558	13935
Société "La Fraternité," à Lessines. (1879)	H	...	...	...	...	...	...	...	2	2	4	7	Inconnu	10	10	8	6
	E	124	104	104	117	141	230	344	445	410	300	256		198	191	219	243
	RO	707	701	744	816	906	1347	2153	4083	3497	2625	2284		1807	1696	1848	1983
	DO	611	665	587	595	592	884	1895	1899	3949	2152	2545		1946	1412	2452	2325
	RE	15	343	56	51	43	183	8	171	26	206	393		315	122	273	288
	DE	...	...	...	...	...	...	...	...	...	...	27		18	96	130	160
	A	1087	1467	1681	1953	2311	2957	3223	5579	5153	6044	6150		5846	6246	5933	5718

TABLEAU DE LA SITUATION ACTIVE, DE 1880 À 1895—*suite.*

Sociétés. Année de la reconnaissance légale)	—	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895
Société "L'Union Fraternelle," à Péruwelz. (1882)	H	...	...	30	29	31	29	27	27	29	29	29	31	30	35	35	39
	E	...	...	153	170	183	191	193	219	244	273	294	315	346	382	428	471
	RO	...	...	856	1038	1085	1164	1148	1316	1485	1663	1795	1945	2059	2304	2457	2792
	DO	...	...	543	882	1207	918	1296	1011	1647	1786	2297	2356	2183	2059	2387	2566
	RE	...	...	271	467	277	265	253	253	226	299	299	231	195	725	500	249
	DE	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	A	...	...	1300	1924	2078	2590	2695	3253	3317	3493	3290	3110	3181	4152	4721	5197
Société "Les Ouvriers de la Ville de Mons," à Mons. (1852)	H	110	103	105	117	116	106	109	115	113	113	118	111	98	100	106	101
	E	147	142	149	163	162	157	155	162	232	257	292	234	297	271	271	271
	RO	2372	3055	2080	2237	2164	2214	2239	2844	2920	3751	3487	4590	4743	4812	4763	4981
	DO	1984	3721	3138	2604	4188	4021	2327	2705	3265	4282	3488	5863	6401	5856	5342	6861
	RE	1220	2351	3055	2473	2614	1529	1261	2768	1081	1822	1027	832	2237	2130	1535	1699
	DE	474	457	676	1420	1235	1910	475	1815	464	1245	386	5754	1496	1554	1276	949
	A	17803	39165	39480	40489	39957	39523	40643	41735	8557	42560	43692	42863	42724	43325	43852	43473
Société "L'Alliance," à Lessines. (1887)	H	...	...	...	...	...	...	...	...	10	16	14	15	14	14	14	14
	E	...	...	...	...	...	...	...	192	212	183	172	185	295	323	336	334
	RO	...	...	...	...	...	...	...	913	1399	1490	1449	1729	2338	3006	2979	3094
	DO	...	...	...	...	...	...	...	438	1159	954	1107	1427	1779	2274	2991	3236
	RE	...	...	...	...	...	...	...	570	175	492	250	206	395	212	308	588
	DE	...	...	...	...	...	...	...	...	...	...	...	...	...	50	...	324
	A	...	...	...	...	...	...	...	1045	1460	2487	3079	3587	4541	5491	5786	5907
Société "L'Union," à Dampremy. (1888)	H	...	...	...	...	...	...	...	...	76	104	124	95	80	56	44	35
	E	...	...	...	...	...	...	...	...	113	230	270	300	255	185	127	132
	RO	...	...	...	...	...	...	...	...	439	1920	3084	3828	3595	2521	2160	1835
	DO	...	...	...	...	...	...	...	...	514	2274	3445	4979	4728	2831	2187	1793
	RE	...	...	...	...	...	...	...	...	887	1931	1600	1228	831	648	452	430
	DE	..	...	...	...	...	...	...	...	...	150	165	202	290	409	188	194
	A	...	...	...	...	...	...	...	...	812	2240	3314	3189	2597	2526	2763	3041
"Société des Sauveteurs de la Sambre," à Charleroi. (1876)	H	72	67	55	53	52	61	66	81	91	101	100	97	94	91	82	78
	E	122	124	116	118	121	125	148	152	168	188	208	217	235	258	245	262
	RO	1671	1635	1548	1607	1690	1782	1948	2191	2370	2740	2964	3032	3230	3336	3429	3325
	DO	3753	1690	2623	1071	1524	2644	2814	3261	2583	4163	3832	5123	3827	4016	5581	4968
	RE	1283	1125	930	954	829	1033	1624	1069	1226	1425	1365	1213	2130	1090	1224	1339
	DE	...	...	...	...	...	...	52	31	...	...	...	50	...	...	33	...
	A	3609	4679	4534	6024	7020	7190	7897	7865	8878	8880	9377	8449	9982	10193	9232	8948
"Société de Prévoyance et de Secours Mutuels, à Gosselies. (1853)	H	65	61	61	72	88	86	79	73	78	75	78	73	...	...	97	101
	E	123	116	114	106	108	110	117	114	109	108	357	344	358	283	226	199
	RO	875	856	832	791	802	812	868	844	794	798	1381	2147	1883	1661	1535	1261
	DO	1261	793	994	903	1082	1011	971	1206	925	952	1215	2811	2067	1308	1281	1327
	RE	369	349	349	401	471	468	436	402	432	415	432	405	683	556	511	530
	DE	41	25	25	125	50	75	100	...	100	100	56	...	140	160	147	119
	A	6090	6476	6639	6804	6944	7138	7371	7410	7611	7772	8314	8055	8415	10082	10699	11044

Société "Les Voyageurs et Employés de Commerce du Hainaut," à Mons. (1887)	H	...	...	...	...	...	...	...	9	8	40	54	50	57	59	56	59
	E	...	...	...	...	...	...	...	39	41	102	119	211	266	288	301	302
	RO	...	...	...	...	...	...	...	584	685	1685	1879	3156	4093	4359	4492	4632
	DO	...	...	...	...	...	...	...	278	356	447	1375	1593	2400	3398	3991	3648
	RE	...	...	...	...	...	...	...	135	320	700	910	750	1046	3820	1042	1181
	DE	...	...	...	...	...	...	...	...	...	150	212	...	...	260	120	855
	A	...	...	...	...	...	...	...	3912	4561	6349	7551	9864	12604	17124	18548	19858
Société "Les Amis Réunis," à La Louvière. (1888)	H	...	...	...	...	...	...	...	...	...	27	25	27	28	25	21	18
	E	...	...	...	...	...	...	...	...	...	136	143	200	263	258	251	260
	RO	...	...	...	...	...	...	...	...	...	2577	2749	3130	4687	4987	4654	4816
	DO	...	...	...	...	...	...	...	...	...	1847	1987	1669	3048	4895	4384	3042
	RE	...	...	...	...	...	...	...	...	...	424	295	380	312	332	277	241
	DE	...	...	...	...	...	...	...	...	...	...	80	63	204	144	204	189
	A	...	...	...	...	...	...	...	...	...	2791	3767	5545	7293	7573	7915	9741
Société "La Fraternelle," à Couillet. (1889)	H	...	...	...	...	...	...	...	...	...	21	26	33	45	64	61	58
	E	...	...	...	...	...	...	...	...	...	90	120	143	198	239	260	267
	RO	...	...	...	...	...	...	...	...	...	1363	1983	2466	3265	3918	4636	4457
	DO	...	...	...	...	...	...	...	...	...	831	1488	2094	2953	2831	4662	4394
	RE	...	...	...	...	...	...	...	...	...	399	417	272	547	715	944	459
	DE	...	...	...	...	...	...	...	...	...	100	...	10	44	192	70	70
	A	...	...	...	...	...	...	...	...	...	1795	2663	3297	4113	5723	6472	6924
Société "St. Eloy," à Roeulx. (1887)	H	...	...	...	...	...	...	...	40	28	27	18	18	23	22	21	21
	E	...	...	...	...	...	...	...	100	112	114	126	142	172	194	210	198
	RO	...	...	...	...	...	...	...	900	1438	1511	1628	2056	2156	2755	2765	2679
	DO	...	...	...	...	...	...	...	288	1137	1330	1376	2292	1900	2381	2383	3874
	RE	...	...	...	...	...	...	...	541	385	542	387	432	597	420	467	506
	DE	...	...	...	...	...	...	...	...	...	40	...	60	...	...	160	120
	A	...	...	...	...	...	...	...	1153	1839	2522	3162	3298	4152	4946	5635	4827
Société "La Prévoyance," à Mons. (1882)	H	...	...	11	15	13	15	15	16	17	24	29	29	24	26	23	23
	E	...	...	97	85	88	87	88	107	103	86	93	162	100	92	90	298
	RO	...	...	2044	1545	1722	1825	1886	2295	2123	1687	1856	1951	1986	2034	1803	1805
	DO	...	...	3338	1487	2053	2476	2181	1829	2875	1243	1487	1816	2746	1682	1857	1511
	RE	...	...	1724	335	403	446	596	670	737	464	489	631	1236	710	816	919
	DE	...	...	70	...	...	296	599	556	768	383	275	548	701	564	840	711
	A	...	...	2030	2350	2359	1859	1437	2018	1240	1766	2349	2567	2340	2838	2760	3262

Si l'on assimile les opérations des sociétés de secours mutuels à des opérations d'assurance, il est possible, en appliquant les procédés de la science actuarielle, d'évaluer leurs engagements.

Mais l'application des méthodes d'évaluation en question n'est recevable que pour autant que l'on admette que les sociétés de secours mutuels font de l'assurance. Or, on a contesté cette opinion: la *Revue des Sociétés Civiles et Commerciales* (année 1896, pages 280 et suivantes) prétend que le contrat entre l'affilié et l'association de secours mutuels qui s'oblige au payement de frais de funérailles "n'est pas un contrat " d'assurance sur la vie, parce que celui-ci est essentiellement commercial " et aléatoire, parce que la société mutualiste n'est pas une société " commerciale, parce qu'elle n'est pas une société civile."

Mr. H. Adan, Président de l'Association des Actuaires Belges, a publié, dans le numéro du 21 mars 1897 du *Moniteur des Intérêts Matériels*, une étude sur "la nature de certaines sociétés mutualistes "reconnues suivant la loi de 1894," en réponse à l'article précité de la *Revue des Sociétés Civiles et Commerciales*.

Il émet nettement l'opinion que les sociétés de secours mutuels font de l'assurance, et il appuie sa thèse sur des considérations d'ordre juridique et sur des citations nombreuses de l'exposé des motifs à l'appui de la loi de 1894, qui emploie fréquemment le mot *assurance* pour désigner les opérations pratiquées par les sociétés mutualistes.

Voici la conclusion de l'étude de Mr. H. Adan:

" À moins qu'on ne prétende reprocher à l'exposé des motifs, à la loi, " aux statuts, l'emploi réitéré d'une terminologie irréfléchie ou vicieuse " qu'il faudrait réformer; à moins qu'on ne conteste la légalité de " l'assurance mutuelle à responsabilité ou à cotisation limitée,[1] bien " qu'on la voie fonctionner au grand jour, la convention envisagée est un " contrat d'assurance ayant pour but: d'assurer, de garantir, suivant " l'espèce, des sommes en cas de maladie, blessures, infirmités, décès, " perte de bétail, etc.

" Aucun doute ne doit planer sur cette question.

"Nous estimons qu'elle doit être résolue dans notre sens si, à " l'exemple de ce qui se passe en Angleterre et suivant les sages conseils " de Maze, de Prosper de Laffitte, en France,[2] on veut pousser *progressive-* " *ment* les sociétés mutualistes dans les voies d'une solvabilité sérieuse, " d'une solvabilité actuarielle, ce qui à nos yeux est un impérieux devoir. " Nous pensons que ce devoir a été compris le jour où le législateur " belge a prescrit, en l'article 34 de la loi, l'établissement de tables de " risques spécialement dressées pour les sociétés mutualistes.

"Cette mesure implique bien la volonté de modifier la situation " présente, de diriger ces sociétés dans les voies rationnelles, d'arriver à " fournir à ces sociétés les procédés techniques de l'assurance, afin " d'équilibrer leurs ressources et leurs charges, afin de les mettre en mesure " de remplir sérieusement leurs engagements, afin de les rendre par- " faitement viables."

D'autre part, on a souvent affirmé que "la prévoyance et non la " bienfaisance doit être la base de l'œuvre. Il y a là deux ordres

[1] Voir *Recueil Périodique des Assurances*, année 1885, pages 226 et 68. Voir *Pandectes Françaises, verbo Assurance Mutuelle*, nos. 116, 117 et suivants.

[2] Voir *Essai d'une Théorie Rationnelle des Sociétés Mutualistes.*

" d'idées parfaitement distincts, que l'on doit se garder de confondre, " surtout lorsqu'il s'agit d'institutions permanentes à élever au rang " d'établissements d'utilité publique. Que l'on observe donc de mettre " les statuts de ces institutions en harmonie avec le véritable esprit de " la loi. En les rédigeant, il ne faut jamais perdre de vue que l'assis- " tance mutuelle doit avant tout compter sur *elle-même* et n'admettre " l'intervention de la charité qu'à titre d'accessoire. L'association " mutuelle est, en effet, un contrat, et comme chaque membre ne fait " adhésion aux statuts que pour être soutenu contre les éventualités " qu'ils ont pour objet de prévoir, l'institution ne peut, en aucun cas, " être considérée comme un établissement de charité." [1]

Dans la même notice nous trouvons plus loin les lignes suivantes :

" Nous insistons sur ce point d'une manière toute spéciale : les " recettes provenant des cotisations des membres effectifs, des amendes, " des droits d'entrée, doivent permettre de faire face aux dépenses qui " sont de l'essence de ces sociétés (et que l'on traite généralement " *d'obligatoires*), telles que secours aux malades, honoraires des médecins, " achat de médicaments, frais de funérailles et frais d'administration. " Les sociétés qui fonctionnent ainsi sont considérées comme bien " organisées."

Le dernier Rapport de la Commission Permanente des Sociétés Mutualistes (1897) s'exprime, dans le même ordre d'idées, comme il suit :

" L'assistance mutuelle doit avant tout compter sur elle-même " et appliquer rigoureusement le principe de ' l'assistance par soi- " ' même.'

" Les ressources *extraordinaires* (souscriptions des membres honoraires " et bienfaiteurs, amendes, dons particuliers, legs, subventions, etc., etc.), " constituents des recettes aléatoires et extra-sociales sur lesquelles la " société mutualiste ne doit pas compter pour faire face à ses dépenses " *ordinaires* obligatoires."

Il résulte de ce qui précède que les sociétés de secours mutuels répondent au type de sociétés d'assurances garantissant les associés contre les risques de la maladie et du décès, et que, par conséquent, on peut leur appliquer les méthodes de la science actuarielle pour la détermination de leurs engagements et de leur situation financière.

Nous nous proposons de déterminer, pour quelques sociétés existantes d'un type assez fréquemment adopté en Belgique, l'importance de leur passif à une date fixée, et de dresser leur bilan.

Nous adopterons pour cela les bases suivantes : la table de mortalité de Quetelet (1846), la table de morbidité de Kinkelin, le taux d'intérêt de 3 p. c.

Nous essayerons de justifier comme il suit le choix de nos bases de calculs :

A. Table de mortalité.—La table de mortalité de Quetelet est une table belge, déduite d'observations faites sur la population générale de notre pays (les deux sexes) au moyen de documents de l'État civil de 1841 à 1850 et du recensement de 1846. Cette table est généralement employée dans notre pays : elle a servi de base à l'établissement des tarifs de la Caisse de Retraite de l'État. Il nous a paru qu'elle peut

[1] " Notice sur les Sociétés de Secours Mutuels et de Prévoyance," publiée en 1867 par la Commission Permanente des Sociétés de Secours Mutuels.

être adoptée, comme représentant avec une approximation suffisante la mortalité qui frappe les membres de nos sociétés mutualistes. Elle se rapproche d'ailleurs de la table de mortalité de Farr, qui a été construite au moyen d'observations faites sur la population générale de l'Angleterre.

B. Table de morbidité.—La table de morbidité de Kinkelin est déduite d'observations faites par M. le Docteur Heym sur la population de la "Gegenseitigkeit (Mutualité)," Compagnie d'assurances contre la maladie, contre l'infirmité et sur la vie à Leipzig.

Nous aurions évidemment préféré adopter une table de morbidité belge ; mais il n'en existe pas. Nous avons choisi la table de Kinkelin, parce que l'auteur de cette table qui mentionne, par âge, le nombre moyen de jours de maladie par an, a indiqué des facteurs de réduction pour tenir compte de la cessation du secours après un mois, deux mois, trois mois, six mois et neuf mois, durées de maladie le plus fréquentes, pour lesquelles nos sociétés accordent des secours.[1]

Nous ne savons si les indications de la table de Kinkelin réflètent avec une exactitude suffisante le phénomène de la morbidité, tel qu'il se produit en Belgique, et nous sommes obligé de formuler quelques réserves à ce sujet. Mais nous pensons que l'application d'une table déduite d'expériences faites en Belgique nous conduirait à des résultats qui ne différeraient pas de ceux que nous avons obtenus, au point d'amener une modification dans les conclusions générales que nous en déduirons.

C. Taux d'intérêt.—Nous avons adopté le taux d'intérêt de 3 p. c. parce que presque toutes nos sociétés mutualistes déposent leurs fonds disponibles à la Caisse d'Épargne, qui leur bonifie un intérêt de 3 p. c.

Au point de vue de la théorie, nous avons suivi la méthode générale indiquée dans le Text-Book de l' Institut des Actuaires de Londres.

Soient z_x le nombre moyen de jours de maladie pendant une année, pour des personnes d'âge x à l'origine de cette année, et l_x le nombre de survivants indiqué par la table de mortalité à l'âge x.

Si s_x représente la valeur actuelle d'un secours de 1 franc par jour de maladie pendant toute l'existence, on aura, en supposant que la totalité des secours soit payée au milieu de chaque année :[2]

$$l_x\, s_x = v^{\frac{1}{2}} \left[l_x\, z_x + l_{x+1}\, z_{x+1}\, v + l_{x+2}\, z_{x+2}\, v^2 + \ldots . \right];$$

[1] Mr. Kinkelin estime que "il est probable que le nombre de jours de maladie ne diminuera pas dans le même rapport à chaque âge, lorsque la durée de l'assistance sera réduite."

"Mais," ajoute-il, "à défaut de matériaux plus complets, nous nous contenterons de poser le principe suivant, qui s'applique à tous les âges :

"Lorsque la durée du secours est moindre qu'une année, on obtient le nombre moyen "des journées de maladie à un âge quelconque en multipliant celui des journées de "maladie dans le cas de secours pendant une année entière, par un certain facteur de "réduction qui a les valeurs suivantes :

Durée des secours	Facteurs de réduction (sexe masculin)
4 semaines au plus	0,321
6 „ „ „	0,469
9 „ „ „ (2 mois)	0,578
13 „ „ „ (3 mois)	0,684
26 „ „ „ (6 mois)	0,848
39 „ „ „ (9 mois)	0,934

[2] Nous adoptons, autant que possible, la notation de l'Institut des Actuaires de Londres.

d'où

$$s_x = v^{\frac{1}{2}} \frac{D_x z_x + D_{x+1} z_{x+1} + \ldots}{D_x}$$

ou

$$s_x = \frac{K_x}{D_x} \ldots . \text{ (I)}.$$

dans laquelle

$$K_x = v^{\frac{1}{2}} \sum_{x}^{\omega} D_x z_x$$

Si les secours devaient cesser à l'âge X, on aurait :

$$s_{x:\overline{X-x}|} = \frac{K_x - K_X}{D_x} \ldots . \text{ (II)}.$$

Les formules (I) et (II) serviront à déterminer la valeur actuelle d'un secours de 1 franc.

La valeur de cotisations mensuelles de 1 franc payables jusqu'à la fin de la vie sera, si l'on suppose ces cotisations perçues au commencement de chaque mois, donnée par l'expression :

$$1 + 12.\ a_x^{(12)} \ldots . \text{ (III)}.$$

Pour calculer la valeur de cette expression nous nous sommes servi des chiffres des tarifs de la Caisse de Retraite qui indiquent la rente annuelle, payable par douzièmes mensuels, qui correspond à 10 francs de versement à capital abandonné ; cette somme comprend fr. 9.70 pour le prix pur de la rente et fr. 0.30 pour frais.

Si donc, on désigne par T_x le chiffre des tarifs de la Caisse de Retraite à l'âge x (rente immédiate), on aura :

$$a_x^{(12)} = \frac{1}{\frac{1}{10} \cdot \frac{100}{97} \cdot T_x} = \frac{9{,}7}{T_x}$$

S'il s'agit d'une cotisation mensuelle payable jusqu'à l'âge X, la valeur actuelle en sera donnée par l'expression :

$$1 + 12.a_{x\ \overline{X-x}|}^{(12)} - \frac{D_X}{D_x}$$

ou

$$1 + 12\left[a_x^{(12)} - {}_{X-x|}a_x^{(12)}\right] - \frac{D_X}{D_x}$$

Expression que l'on peut mettre sous une forme plus symétrique en écrivant :

$$1 + 12\ a_x^{(12)} - \frac{D_X}{D_x}\left[1 + 12 a_X^{(12)}\right] \ldots . \text{ (IV)}.$$

Les formules (III) et (IV) donneront la valeur d'une cotisation mensuelle de 1 franc.

La plupart des sociétés pratiquant l'assurance au décès pour la vie

entière en accordant des frais funéraires, il nous a paru utile de calculer le prix de l'assurance au décès de 1 franc au moyen de l'expression :

$$[1+i]^{\frac{1}{2}}\frac{M_x}{D_x} = 1.0149\frac{M}{D_x}$$

Les divers éléments dont il est question plus haut ont été déterminés à l'aide de la Table de Commutation suivante, dont les données ont été combinées, pour le calcul de la valeur des cotisations mensuelles, avec les chiffres des tarifs de la Caisse de Retraite.

TABLE DE COMMUTATION

Taux 3 %, Table de mortalité de Quetelet, Table de morbidité de Kinkelin.

x	l_x	$D_x = l_x v^x$	$N_x = \sum_{x+1}^{\omega} D_x$	$C_x = d_x v^{x+1}$	$M_x = \sum_{x}^{\omega} C_x$	z_x	$K_x = v^{\frac{1}{2}} \sum_{x}^{\omega} D_x z_x$	x
0	1000	1000,	17840,231821	145,631100	451,255463	...	...	0
1	850	825,242900	17014,988921	58,440952	305,624363	...	...	1
2	788	742,765648	16272,223273	27,454260	247,183411	...	...	2
3	758	693,677636	15578,545637	17,769740	219,729151	...	...	3
4	738	655,703406	14922,842231	11,213917	201,959411	...	...	4
5	725	625,391525	14297,450706	8,374840	190,745494	...	...	5
6	715	598,801060	13698,649646	6,504736	182,370654	...	...	6
7	707	574,856044	13123,793602	5,525863	175,865918	...	...	7
8	700	552,586300	12571,207302	4,598502	170,340055	...	...	8
9	694	531,893398	12039,313904	3,720470	165,741553	...	...	9
10	689	512,680766	11526,633138	4,334526	162,021083	...	...	10
11	683	493,413553	11033,219585	3,506900	157,686557	...	...	11
12	678	475,535640	10557,683945	3,404755	154,179657	...	...	12
13	673	458,280023	10099,403922	3,305590	150,774902	...	...	13
14	668	441,626824	9657,777098	3,209310	147,469312	...	...	14
15	663	425,554506	9232,222592	3,739002	144,260002	...	...	15
16	657	409,420719	8822,801873	3,025080	140,521000	6,32	66972,3140	16
17	652	394,470432	8428,331441	2,936975	137,495920	6,16	64422,7362	17
18	647	380,044565	8048,286876	3,421716	134,558945	6,02	62028,4474	18
19	641	365,553326	7682,733550	3,322056	131,137229	5,89	59774,1436	19
20	635	351,584260	7331,149290	3,225294	127,815173	5,78	57652,6223	20
21	629	338,118321	6993,030969	3,131358	124,589879	5,68	55650,2782	21
22	623	325,139339	6667,891630	3,546844	121,458521	5,60	53757,9415	22
23	616	312,122272	6355,769358	2,951604	117,911677	5,53	51963,8735	23
24	610	300,079740	6055,689618	2,865636	114,960073	5,47	50263,1544	24
25	604	288,474024	5767,215594	3,245865	112,094437	5,44	48645,8044	25
26	597	276,825915	5490,389679	2,701134	108,848572	5,42	47099,5285	26
27	591	266,061699	5224,327980	2,622462	106,147438	5,41	45621,1440	27
28	585	255,690045	4968,637935	2,546076	103,524976	5,42	44202,8671	28
29	579	245,696334	4722,941601	2,471922	100,978900	5,44	42837,3585	29
30	573	236,068551	4486,873050	2,399922	98,506978	5,48	41520,3793	30
31	567	226,792629	4260,080421	2,330022	96,107056	5,53	40245,7022	31
32	561	217,857057	4042,223364	2,262156	93,777034	5,60	39009,9386	32
33	555	209,249430	3832,973934	2,196270	91,514878	5,68	37807,8370	33
34	549	200,958705	3632,015229	2,132298	89,318608	5,78	36636,7371	34
35	543	192,972969	3439,042260	2,415224	87,186310	5,90	35492,2364	35
36	536	184,937152	3254,105108	2,009898	84,771086	6,03	34370,3989	36
37	530	177,540990	3076,564118	1,951356	82,761188	6,17	33271,5880	37
38	524	170,418424	2906,145694	2,210278	80,809832	6,33	32192,2307	38
39	517	163,244818	2742,900876	1,839342	78,599554	6,51	31129,3082	39
40	511	156,650627	2586,250249	2,083396	76,760212	6,70	30082,1755	40
41	504	150,004512	2436,245737	2,022713	74,676816	6,90	29048,0142	41
42	497	143,612623	2292,633114	1,963801	72,654103	7,12	28028,1678	42
43	490	137,466070	2155,167044	1,906604	70,690302	7,36	27020,6472	43
44	483	131,545676	2023,611368	1,851073	68,783698	7,61	26023,7398	44
45	476	125,872964	1897,738404	1,797159	66,932625	7,88	25037,2883	45
46	469	120,409653	1777,328751	1,744813	65,135466	8,16	24059,9606	46
47	462	115,157658	1662,171093	1,693993	63,390653	8,45	23091,8320	47
48	455	110,109545	1552,061548	1,644650	61,696660	8,76	22133,0252	48
49	448	105,257600	1446,803948	1,824856	60,052010	9,09	21182,6168	49
50	440	100,367080	1346,436868	1,771704	58,227154	9,43	20239,8620	50
51	432	95,672016	1250,764852	1,720104	56,455450	9,79	19307,2854	51
52	424	91,165512	1159,599340	1,878750	54,735346	10,16	18384,3975	52
53	415	86,631250	1072,968090	1,824030	52,856596	10,55	17471,7447	53
54	406	82,284020	990,684070	1,770903	51,032566	10,95	16571,1929	54
55	397	78,116499	912,567571	1,910360	49,261663	11,37	15683,4015	55

TABLE DE COMMUTATION—*suite.*

x	l_x	$D_x=l_x v^x$	$N_x=\sum_{x+1}^{\omega} D_x$	$C_x=d_x v^{x+1}$	$M_x=\sum_{x}^{\omega} C_x$	z_x	$K_x=v^{\frac{1}{2}}\sum_{x}^{\omega} D_x z_x$	x
56	387	73,930932	868,636339	1,854720	47,351303	11,80	14808,2472	56
57	377	69,922944	768,713695	1,800700	45,496583	12,25	13948,6611	57
58	367	66,085690	702,628005	1,923075	43,695883	12,72	13104,6719	58
59	356	62,237700	640,390305	1,867063	41,772808	13,19	12276,3941	59
60	345	58,557885	581,832420	1,812679	39,905745	13,69	11467,5222	60
61	334	55,039526	526,792894	1,919880	38,093066	14,20	10677,6254	61
62	322	51,516780	475,276114	1,863960	36,173186	14,72	9907,5305	62
63	310	48,152300	427,123814	1,960478	34,309226	15,26	9160,3284	63
64	297	44,789382	382,334432	1,903369	32,348748	15,81	8436,3044	64
65	284	41,581292	340,753140	1,847937	30,445379	16,38	7738,5727	65
66	271	38,522379	302,230761	1,932126	28,597442	16,97	7067,4632	66
67	257	35,468313	266,762448	1,741857	26,665316	17,57	6423,3287	67
68	244	32,693316	234,069132	1,821204	24,923459	18,18	5809,2931	68
69	230	29,919780	204,149352	1,768158	23,102255	18,81	5223,6487	69
70	216	27,280152	176,869200	1,839285	21,334097	19,46	4669,1138	70
71	201	24,646419	152,222781	1,785705	19,494812	20,12	4146,0294	71
72	186	22,142742	130,080039	1,849280	17,709107	20,80	3657,4188	72
73	170	19,648600	110,431439	1,795424	15,859827	21,49	3203,6075	73
74	154	17,280956	93,150483	1,634175	14,064403	22,19	2787,5537	74
75	139	15,143355	78,007128	1,480808	12,430228	22,92	2409,7140	75
76	125	13,221500	64,785628	1,437674	10,949420	23,65	2067,7193	76
77	111	11,398701	53,386927	1,196400	9,511746	24,40	1759,6182	77
78	99	9,870300	43,516627	1,258348	8,315346	25,17	1485,5702	78
79	86	8,324456	35,192171	1,033747	7,056998	25,95	1240,7794	79
80	75	7,048275	28,143896	0,912400	6,023251	26,75	1027,9278	80
81	65	5,930600	22,213296	0,885820	5,110851	27,56	842,0632	81
82	55	4,872010	17,341286	0,774018	4,225033	28,39	681,1025	82
83	46	3,956092	13,385194	0,667976	3,451015	29,23	544,8156	83
84	38	3,172886	10,212308	0,567455	2,783039	30,09	430,8752	84
85	31	2,513015	7,699293	0,472224	2,215584	30,96	336,8033	85
86	25	1,967600	5,731693	0,382060	1,743360	31,85	260,1422	86
87	20	1,528240	4,203453	0,370930	1,361300	32,76	198,3935	87
88	15	1,112790	3,090663	0,216078	0,990370	33,67	149,0641	88
89	12	0,864312	2,226351	0,209784	0,774292	34,61	112,1458	89
90	9	0,629352	1,596999	0,135782	0,564508	35,56	82,6713	90
91	7	0,475237	1,121762	0,131828	0,428726	36,52	60,6181	91
92	5	0,329570	0,792192	0,063994	0,296898	37,50	43,5184	92
93	4	0,255976	0,536216	0,062130	0,232904	38,50	31,3398	93
94	3	0,186390	0,349826	0,060320	0,170774	39,51	21,6284	94
95	2	0,120640	0,229186	0,	0,110452	40,53	14,3717	95
96	2	0,117126	0,112060	0,056858	0,110452	41,55	9,5555	96
97	1	0,056858	0,055202	0,	0,053594	42,59	4,7614	97
98	1	0,055202	...	0,053594	0,053594	43,64	2,3736	98
99	0	...	...	...	...	...	...	99

Le tableau suivant indique la valeur actuelle de l'unité de cotisation mensuelle et la valeur actuelle de l'unité de secours de maladie lorsque la durée du secours est de 1 an : 1° lorsque le droit au secours est limité à 65 ans ; 2° lorsque le droit au secours est limité à 70 ans ; 3° lorsque le droit au secours persiste pendant toute l'existence des sociétaires. Il indique en outre la valeur actuelle de l'unité d'assurance au décès.

A l'aide du tableau ci-contre, nous pouvons déterminer approximativement, en dressant le bilan à une date déterminée, la situation financière d'une société existante.

Nous avons pu obtenir les renseignements nécessaires à cette fin au sujet de trois sociétés existantes que nous allons examiner successivement.

Ces sociétés sont nettement différentes au point de vue de leur ancienneté ; la première a été fondée en 1860, la deuxième en 1882, la troisième en 1895.

Age	Valeur actuelle de l'unité de secours par jour de maladie, le droit au secours			Valeur actuelle de l'unité de cotisation mensuelle payable			Valeur actuelle de l'unité d'assurance au décès
	cessant à 65 ans	cessant à 70 ans	persistant pendant la vie entière	viagèrement jusque 65 ans	viagèrement jusque 70 ans	pendant la vie entière	
16	144,677	152,174	163,578	254,458	259,473	265,119	0,348 33
17	143,697	151,478	163,315	251,855	257,060	262,920	0,353 75
18	142,851	150,928	163,214	249,168	254,570	260,653	0,359 33
19	142,347	150,744	163,517	246,787	252,403	258,727	0,364 08
20	141,969	150,699	163,980	244,336	250,176	256,751	0,368 95
21	141,701	150,779	164,588	241,807	247,879	254,716	0,373 97
22	141,537	150,978	165,338	239,202	245,517	252,627	0,379 12
23	141,692	151,526	166,485	236,908	243,486	250,893	0,383 40
24	141,710	151,940	167,499	234,156	240,998	248,702	0,388 80
25	141,805	152,446	168,631	231,315	238,432	246,446	0,394 36
26	142,186	153,275	170,141	228,773	236,189	244,540	0,399 06
27	142,382	153,919	171,468	225,768	233,485	242,174	0,404 90
28	142,611	154,616	172,876	222,660	230,689	239,730	0,410 91
29	142,854	155,347	174,350	219,455	227,811	237,220	0,417 11
30	143,101	156,104	175,882	216,142	224,839	234,632	0,423 49
31	143,334	156,868	177,455	212,715	221,769	231,962	0,430 08
32	143,540	157,630	179,061	209,174	218,598	229,209	0,436 86
33	143,700	158,369	180,683	205,526	215,337	226,385	0,443 86
34	143,801	159,076	182,309	201,722	211,939	223,443	0,451 08
35	143,821	159,728	183,923	197,777	208,440	220,420	0,458 53
36	144,004	160,602	185,849	193,742	204,801	217,301	0,465 20
37	143,814	161,104	187,402	189,907	201,471	214,492	0,473 09
38	143,491	161,503	188,901	185,571	197,619	211,184	0,481 24
39	143,286	162,089	190,691	181,081	193,607	207,768	0,488 65
40	142,633	162,228	192,033	176,782	189,889	204,646	0,497 30
41	142,058	162,521	193,647	172,325	186,013	201,424	0,505 24
42	141,280	162,653	195,165	167,707	182,004	198,101	0,513 44
43	140,267	162,597	196,562	162,915	177,850	194,667	0,521 90
44	138,991	162,324	197,815	157,944	173,550	191,122	0,530 63
45	137,429	161,815	198,909	152,778	169,089	187,455	0,539 66
46	135,548	161,041	199,817	147,415	164,466	183,665	0,549 00
47	133,323	159,978	200,523	141,844	159,673	179,747	0,558 66
48	130,728	158,605	201,009	136,047	154,694	175,689	0,568 66
49	127,724	156,887	201,245	130,018	149,524	171,486	0,579 02
50	124,555	155,138	201,658	124,007	144,496	167,529	0,588 78
51	120,920	153,004	201,807	117,807	139,266	163,430	0,598 88
52	116,774	150,444	201,660	111,310	133,831	159,189	0,609 33
53	112,351	147,783	201,679	104,798	128,497	155,182	0,619 22
54	107,343	144,646	201,390	97,995	122,946	151,041	0,629 43
55	101,704	140,998	200,769	90,879	117,162	146,756	0,640 01
56	95,625	137,143	200,298	83,654	111,425	142,694	0,650 02
57	88,813	132,711	199,486	76,076	105,438	138,500	0,660 36
58	81,199	127,646	198,298	68,114	99,182	134,163	0,671 05
59	72,911	122,229	197,250	59,924	92,913	130,056	0,681 17
60	63,679	116,097	195,832	51,283	86,344	125,822	0,691 62
61	53,398	109,167	193,999	42,146	79,449	121,450	0,702 41
62	42,101	101,684	192,316	32,583	72,438	117,311	0,712 62
63	29,526	93,271	190,236	22,410	65,048	113,057	0,723 12
64	15,578	84,109	188,354	11,605	57,445	109,059	0,733 00
65	...	73,818	186,107	...	49,376	104,972	0,743 09
66	...	62,259	183,463	...	41,412	101,422	0,753 41
67	...	49,459	181,100	...	31,992	97,169	0,763 00
68	...	34,875	177,690	...	22,153	92,862	0,773 69
69	...	18,534	174,588	...	11,441	88,706	0,783 64
70	...	...	171,153	...	...	84,741	0,793 68
71	...	...	168,220	...	...	80,982	0,802 76
72	...	...	165,174	...	...	77,502	0,811 68
73	...	...	163,045	...	...	74,309	0,819 19
74	...	...	161,307	...	...	71,324	0,825 99
75	...	...	159,126	...	...	68,428	0,833 06
76	...	...	156,390	...	...	65,562	0,840 48
77	...	...	154,370	...	...	62,627	0,846 88

Âge	Valeur actuelle de l'unité de secours par jour de maladie, le droit au secours			Valeur actuelle de l'unité de cotisation mensuelle payable			Valeur actuelle de l'unité d'assurance au décès
	cessant à 65 ans	cessant à 70 ans	persistant pendant la vie entière	viagèrement jusque 65 ans	viagèrement jusque 70 ans	pendant la vie entière	
78	...	...	150,509	...	...	59,804	0,855 00
79	...	...	149,051	...	...	57,083	0,860 36
80	...	...	145,840	...	...	54,449	0,867 29
81	...	...	141,986	...	...	51,678	0,874 61
82	...	...	139,799	...	...	49,470	0,880 12
83	...	...	137,715	...	...	47,290	0,885 32
84	...	...	135,798	...	...	44,802	0,890 19
85	...	...	134,024	...	...	42,734	0,894 77
86	...	...	132,212	...	...	41,195	0,899 23
87	...	...	129,821	...	...	39,600	0,904 03
88	...	...	133,954	...	...	37,763	0,903 24
89	...	...	129,753	...	...	36,024	0,909 19
90	...	...	131,349	...	...	34,098	0,910 32

1°. Société fondée en 1860.

Cette société a fixé la cotisation mensuelle à fr. 0.85. Elle accorde un secours complet aux sociétaires qui ont accompli un stage de 5 ans. Ce secours se compose de fr. 1.65 par jour de maladie, comme indemnité pécuniaire, et des soins médicaux et pharmaceutiques. Aux sociétaires qui ont moins de 5 années d'affiliation, elle accorde des secours inférieurs :

Fr. 1.00 pendant la 1re année.
1.25 „ la 2e „
1.35 „ la 3e „
1.50 „ la 4e „

Elle donne le secours entier pendant les 6 premiers mois et la moitié pendant les 6 mois suivants.

Le droit au secours subsiste pendant toute l'existence des sociétaires.

D'après les renseignements que nous avons pu obtenir, cette société a dépensé, en 1896, fr. 5,796.20 pour 3,055 jours de maladie, ce qui fait, en moyenne, fr. 1.90 par jour de maladie, frais médicaux, pharmaceutiques et divers compris.

Nous avons basé nos calculs sur la supposition que le secours par jour de maladie s'élève au total à fr. 1.90 pendant 1 an au maximum pour les affiliés qui ont plus de 5 années de sociétariat, et nous avons fait l'hypothèse que ceux qui n'ont pas 5 années de sociétariat n'auront aucun droit aux secours jusqu'à la fin de ce terme. Nos évaluations seront ainsi obtenues plutôt par défaut que par excès ; nous ne possédons d'ailleurs pas les éléments nécessaires pour fixer séparément la dépense totale par jour de maladie pour chacune des catégories d'affiliés ayant moins de 5 années de sociétariat.

La Société se composait, au 31 décembre 1896, de 298 membres ayant plus de 5 années de sociétariat et de 114 membres ayant moins de 5 années de sociétariat.

Nous avons trouvé pour la valeur de l'engagement de la société envers les membres ayant plus de 5 années de sociétariat : fr. 107,790.68. Pour les membres ayant moins de 5 années de sociétariat (secours différés), la valeur de l'engagement est fr. 34,880.18. La valeur totale de l'engage-

ment de la société, relatif à l'assurance contre la maladie, est donc égale à fr. 142,670.86.

La société promet en outre, 50 francs au décès de chaque membre qui décède après 5 ans au moins d'affiliation.

Cet engagement, en ce qui concerne les membres qui ont accompli ce stage, est de fr. 8,040.95.

En ce qui concerne les membres qui ont moins de 5 ans de sociétariat, l'engagement de payer 50 francs au décès est différé et vaut fr. 2,245.95.

Donc, la valeur actuelle de l'assurance au décès de 50 francs est fr. 10,286.90.

Pour la valeur actuelle des engagements des sociétaires, c'est-à-dire la valeur des cotisations de fr. 0.85, nous avons trouvé fr. 70,321.94.

Or, au total la valeur actuelle des engagements de la société étant égale à fr. 142,670.86 + fr. 10,286.90 ou fr. 152,957.76, il en résulte que les réserves mathématiques ou la différence entre la valeur actuelle des engagements de la société et la valeur actuelle des engagements des sociétaires s'élèvent à fr. 152,957.76 — fr. 70,321.94 = fr. 82,635.82.

La société possédant au 31 décembre 1896, date de l'évaluation, un actif de fr. 8,121.95, son bilan à cette date peut s'établir comme il suit :

Bilan au 31 *décembre* 1896

Actif		Passif	
Encaisse et placements . .	8,121.95	Réserves mathématiques . .	82,635.82
Mali	74,513.87		
	82,635.82		82,635.82

2°. Société fondée en 1882.

Cette société comprenait au 31 décembre 1897, 454 membres.

Elle a fixé la cotisation mensuelle à fr. 1.10.

Elle assure un secours total de fr. 2.50 pendant les 2 premiers mois de maladie, et fr. 2 pendant les 4 mois suivants; ou ce qui revient au même, fr. 2 pendant 6 mois, et fr. 0.50 de supplément pendant les 2 premiers. Le droit au secours subsiste pendant toute l'existence des sociétaires.

Elle accorde en outre une indemnité funéraire de fr. 50.

Nous avons trouvé pour valeur actuelle des cotisations de tous les membres de la société fr. 103,793.31.

La valeur de fr. 2 de secours pendant 6 mois vaut fr. 138,249.23 et la valeur de fr. 0.50 de secours pendant les 2 premiers mois fr. 23,557.80. Enfin, la valeur actuelle de l'indemnité funéraire est de fr. 10,609.67, de sorte que la valeur actuelle des charges de la société est égale à fr. 138,249.23 + fr. 23,557.80 + fr. 10,609.67 = fr. 172,416.70.

Il s'ensuit que les réserves mathématiques s'élevaient au 31 décembre 1897 à fr. 172,416.70 — fr. 103,793.31 = fr. 68,623.39.

La société possédait, au 31 décembre 1897, fr. 10,578.14 pour faire face aux engagements ci-dessus.

Son bilan, à cette date, se présentait donc comme il suit :

Bilan au 31 *décembre* 1897

Actif		Passif	
Encaisse et placements .	10,578.14	Réserves mathématiques . .	68,623.39
Mali . . .	58,045.25		
	68,623.39		68,623.39

OF THE UNIVERSITY OF CALIFORNIA

3°. Société fondée en 1895.

Cette société comprenait, au 31 décembre 1896, 244 membres.

La cotisation est de 1 franc par mois.

Elle assure un secours total de 2 francs par jour de maladie pendant 6 mois.

Le droit au secours cesse à 70 ans.

Nous avons trouvé pour la valeur actuelle de tous les secours futurs de 2 francs, fr. 63,669.86 et pour valeur actuelle des cotisations, fr. 48,294.41.

Les réserves mathématiques, au 31 décembre 1896, étaient donc fr. 63,669.86 — fr. 48,294.41 = fr. 15,375.45.

Comme l'actif de la caisse principale de cette société, au 31 décembre 1896, s'élevait à fr. 424.66, le bilan à cette date se présente comme il suit :

Bilan au 31 *décembre* 1896

Actif		Passif	
Encaisse et placements . .	424.66	Réserves mathématiques . .	15,375.45
Mali	14,950.79		
	15,375.45		15,375.45

Les trois sociétés que nous venons d'examiner au point de vue actuariel appartiennent à des types assez généralement adoptés en Belgique.

A l'examen des bilans qui précèdent, on est amené à constater que la situation financière traduite par ces bilans n'est guère brillante.

Nous faisons cette constatation non sans un certain sentiment de regret, et nous espérons que, suivant les sages conseils de Mr. Mahillon, nos sociétés renonceront à leurs anciens errements, et qu'elles entreront " dans la voie de la gestion raisonnée des économies de leurs membres " par l'établissement périodique d'une comparaison détaillée des charges " de l'avenir et de la situation personnelle des membres, au point " de vue du risque de maladie." [1]

Si la grande masse de nos mutualistes pratiquants semble n'avoir aucune inquiétude quant à l'avenir réservé à nos sociétés, et professer à cet égard un optimisme caractéristique, il n'en est pas de même des hommes désintéressés qui examinent cette question au moyen des procédés d'investigation de la science actuarielle.

Nous sommes heureux de constater qu'une tendance vers l'application de méthodes rationnelles s'observe dans les milieux officiels : la loi de 1894 a réformé la composition de la Commission Permanente des sociétés mutualistes et y a introduit obligatoirement deux actuaires. La même loi, en son article 34, décrète que des tables de risques appropriées à nos sociétés mutualistes seront dressées par les soins du Gouvernement. Enfin, la Commission Permanente, dans son dernier Rapport, s'exprime ainsi :

' Il faut faire une part plus décisive aux solutions raisonnées de la " science qui nous recommande de poser en principe la péréquation des " recettes et des dépenses et ne pas confondre les ressources ordi-

[1] L. Mahillon, " Les Pensions de Retraite Ouvrières et les Fonds spéciaux de Retraite " (Bruxelles, 1891 : P. Weissenbruch).

" naires (droits d'entrée, et cotisations des membres effectifs ou partici-
" pants et intérêts afférents à ces fonds) avec les ressources extra-
" ordinaires (souscriptions des membres honoraires et protecteurs,
" amendes, dons, legs, subventions, intérêts afférents à ces fonds).

" Les versements des membres effectifs doivent correspondre à
" l'importance des obligations que la société contracte à leur égard.

" En d'autres termes, l'organisation de la société doit être basée sur
" l'application des tables indiquant :

" (*a*) Le nombre moyen de jours de maladie pour les différents âges.
" C'est la table de morbidité ;

" (*b*) Le nombre de ceux qui, sur un nombre donné de naissances,
" atteignent les différents âges de la vie. C'est la table de mortalité.

" Il faut que l'équilibre entre les recettes ordinaires et les dépenses
" ordinaires soit fondé, non pour quelques années, mais pour toute la
" durée de l'association, soit que celle-ci se perpétue par l'adjonction suc-
" cessive de nouveaux membres venant remplacer les décédés, etc., etc.,
" soit que la société prenne fin avec l'existence de ceux qui l'ont fondée.

" Pour atteindre ce résultat, il faut nécessairement que pendant les
" premières années de fonctionnement, les recettes ordinaires laissent un
" excédent afin de constituer un véritable fonds d'économie qui sera
" utilisé plus tard au fur et à mesure que les affiliés avancent en âge
" et que le nombre des jours de maladie s'accroît."

Il nous est particulièrement agréable d'applaudir aux tendances caractérisées dans les lignes qui précèdent. Nous y voyons l'indice de réformes profondes et impérieusement nécessaires dans l'organisation et le fonctionnement de nos sociétés. Sans l'observation des principes scientifiques, la mutualité ne peut que se fourvoyer. Elle doit être équitable, et pour cela elle doit être scientifique ; elle doit, suivant l'heureuse expression de Mr. Chaufton " observer les lois de la
" statistique, c'est-à-dire les lois, numériques qui régissent le cours des
" choses."

Translation.

Friendly Societies in Belgium, considered from an Actuarial standpoint. By L. Duboisdenghien, *Secretary of the Belgian Actuaries' Association, Corresponding Member of the French Institute of Actuaries, and Treasurer of the Permanent Committee of Actuarial International Congresses.*

The Belgian law of the 23rd of June 1894, amending the law of the 3rd of April 1851, on friendly societies, concerns, among others, those associations whose object it is to assure to the members temporary sick benefits, and to provide for funeral expenses.

We shall limit our inquiries to such societies, namely, those whose essential object is assurance against risk of sickness and of death.

These societies are divided, in Belgium, into two classes: the registered, and unregistered *(reconnues et non reconnues)*.

The registered societies are in the enjoyment of incorporation, within limits and under conditions prescribed by the law.

They enjoy special privileges enumerated in Article 8 of the law; they are exempt from certain stamp duties; their publications are inserted in the *Moniteur* gratuitously; and may be granted free postage.

The members of these societies have no liability beyond the amount of their engagements to the Society, in the absence of special provisions contained in the rules. (Art. 7.)

Article 5 runs as follows:—

"A friendly society desiring registration, will make application to "the Governor of the Province in which its principal office is "situated, enclosing two copies of the rules and a list of its officers "or promoters.

"Within a month, the Governor will forward the application, "with a memorandum of opinion, to the Permanent Commission of "Friendly Societies.

"This latter will report to the Government, after having com- "municated, if necessary, with the society and with the Committee "of Employers in the district where the society's office is situated.

"At the expiration of not more than four months from the date "of the application, the Government will notify its considered decision, "granting or refusing registration."

Unregistered societies do not enjoy civil incorporation, and have unrestricted liberty of action.

On 31 December 1895, there were in Belgium 752 registered societies, with 97,591 benefit members, and possessing assets amounting to a total of 3,726,497 francs.

At the same date, there were about 176 unregistered societies, with about 35,732 members, and, approximately, 928,109 francs of assets.

The liabilities of the societies in question have never been subjected to any valuation whatever.

The periodical reports of the Permanent Commission of Friendly Societies contain detailed particulars of the condition as to assets of the societies at the end of each year.

We have thought it would be of interest to arrange the information so as to show the progress of the more important societies in the three provinces; one Flemish, Antwerp; one mixed, Brabant; and one Walloon, Hainaut.

The following table gives particulars for the successive years from 1880 to 1895, both inclusive, that is, a period of 16 years. We have limited this return to those registered societies which, during the period of observation, have attained a membership of at least 200 benefit members, and were registered before 1890.

In the Table we employ the following notation:

H,	number of honorary members.
E,	„ „ benefit members.
R O,	amount of ordinary receipts.
D O,	„ „ ordinary expenditure.
R E,	„ „ extraordinary receipts.
D E,	„ „ extraordinary expenditure.
A,	„ „ total assets.

Honorary members (H) do not participate in the benefits of the society, their function is merely that of moral influence and pecuniary benefaction.

Benefit members (E) participate in the benefits; they are the "assured."

Ordinary Receipts (R O) include members' contributions, entrance fees, fines, and interest on investments.

Ordinary Expenditure (D O) comprises sick pay, medical fees, cost of medicines, funeral expenses, and sundries.

Extraordinary Receipts (R E) are contributions from honorary members, and all receipts (other than members' contributions), donations, legacies, subsidies, profits from fêtes, &c. These are generally applied to purposes beyond the essential object of the society, in favour of members who have exhausted their rights to ordinary benefits, to assist widows and orphans of deceased members, &c.

Extraordinary Expenditure (D E) comprises extraordinary grants, payments to widows and orphans, &c.

The Assets (A) are the total funds of the society.

The figures in the Table are taken from the Report of the Permanent Commission of Friendly Societies in Belgium. We have done no more than group the numbers.

TABLE, *showing the Particulars, from* 1880 *to* 1895, *of Friendly Societies, registered before* 1890, *in the Provinces of Antwerp, Brabant, Hainaut, of which the membership had reached not less than* 200 *benefit members during the period.*

[*For Table see pp.* 350 to 357.].

If we assimilate the operations of friendly societies to those of assurance societies, it is possible, by the application of the processes of actuarial science, to make a valuation of their engagements.

But the application of such valuation processes is only admissible in so far as it is granted that friendly societies really grant assurances. This opinion, however, has been questioned. The *Revue des Sociétés Civiles et Commerciales* (1896, pp. 290 *et seq.*) contends that the contract between the member *(affilié)* and the friendly society guaranteeing funeral expenses "is not a contract of life assurance, "because the latter is essentially commercial and contingent, whereas "a friendly society is not a commercial society, not being a *société* "*civile.*"

Mr. H. Adan, President of the Association of Belgian Actuaries, published, in the March 1897 number of the *Moniteur des Intérêts Matériels*, an article "On the Nature of certain Friendly Societies registered under the Law of 1894", in reply to the article in the *Revue des Sociétés Civiles et Commerciales* above referred to.

He is clearly of opinion that friendly societies do grant assurance; and he rests this opinion upon legal considerations, and supports it by numerous quotations from the Parliamentary Report on the law of 1894, in which the word *assurance* is frequently employed to designate the operations of friendly societies.

Mr. Adan closes his article as follows :—

"Unless it be supposed that, in the Parliamentary Report, in the "law, in the Rules, a terminology has been employed over and over "again, which is either thoughtless or erroneous, and in need of revision; "unless the legality be contested of mutual assurance by guarantee or "by limited assessment,* although they conduct their operations in "full light of day; then the matter in question is a contract of "assurance, having for its object to *assure*, to guarantee, according "to the nature of the particular contract, a sum of money in case of "sickness, injuries, infirmity, death, loss of cattle, &c., as the case "may be.

"There can be no manner of doubt on this question.

"We contend that our opinion must be adopted if, following "the example of what is being done in England, and following "the wise advice of Maze, and of Prosper de Lafitte in France,† "it is desired to gradually put the friendly societies in the way

* See *Recueil Périodique des Assurances*, 1885, pp. 68 and 226.
See also *Pandectes françaises sub voce "Assurance Mutuelle"*, Nos. 116, 117 *et seq.*

† See his Essay on "A Rational Theory of Friendly Societies."

" of attaining real solvency, actuarial solvency, which is, in our opinion, " our bounden duty. We think that this duty was recognized by the " Belgian legislature when it prescribed (in Article 34 of the law) the " preparation of tables specially adapted to the risks undertaken by " friendly societies.

" This measure clearly indicates a desire to deal with the present " state of affairs, and to direct the societies into a rational course, by " furnishing the societies with the technical data for assurance, so as to " balance their resources with their liabilities, to put them in a position " to fulfil their engagements, and to render them absolutely solvent.

" On the other hand, it has frequently been asserted that " thrift, not benevolence, should be the base of the edifice. Here are " two classes of idea perfectly distinct, and which we should guard " against confounding the one with the other: especially when we are " considering permanent institutions which it is sought to elevate to the " rank of establishments of public utility. It should be an object to " put the rules of these institutions in harmony with the true spirit of " the law. In revising them, we should never lose sight of the fact that " mutual aid should, above all things, rely upon *itself* and only admit the " intervention of charity as accessory. Mutual association is, in fact, a " contract, and as each member submits to the rules only in order to be " guaranteed against eventualities, whose only object is providence, the " institution cannot in any case be considered as one of a charitable " nature."

In the same Article we find further on, as follows:

" On this point we particularly insist; the contributions of the " benefit members, the fines, entrance fees, must be sufficient for the " payments which are of the essence of these societies (and which are " treated generally as obligatory), such as sick-pay, medical fees, " cost of funerals, and expenses of management. Societies so acting " are considered as well organized."

The last Report of the Permanent Commission of Friendly Societies (1897) expresses the same sentiments, as follows:

" Mutual aid must, above all things, rely upon itself, and rigorously " apply the principle of self-help.

" *Extraordinary* resources (contributions by honorary members " and benefactors, fines, special gifts, legacies, subventions, &c., &c.) " are contingent receipts on which a society ought not to rely as " against its ordinary expenses under its contracts."

From the foregoing, it will be seen that friendly societies are analogous to that type of assurance society which guarantees its members against risk of sickness and death; and, consequently, that we can apply to them the methods of actuarial science for the valuation of their contracts, and the determination of their financial position.

We propose to ascertain, for certain existing societies of a kind pretty common in Belgium, the weight of their liability at any given date, and to draw up their balance sheet.

We shall adopt the following data:—The Mortality Table of Quetelet, 1846; The Sickness Table of Kinkelin; and 3 per-cent as the Rate of Interest. We adopt these data for the following reasons:

(*a*) Table of Mortality.—Quetelet's is a Belgian Table, derived from observation of the general population, of both sexes, in our country, by means of Government returns from 1841 to 1850, and from the census of 1846. This table is the one generally used in this country, and was used in calculating the tables of rates of the Caisse de Retraite de l'Etat. It seemed to us that it might probably be adopted as representing with a sufficient degree of accuracy the mortality prevailing among members of friendly societies. It is also very similar to Farr's Table, which was based upon observations of the general population in England.

(*b*) Sickness Table.—Kinkelin's Sickness Table was deduced from observations, made by Dr. Heym, of the experience of the "Gegenseitigkeit" Company, of Leipzig, for assurance against sickness and infirmity, and death. We should, of course, have preferred a Belgian table, but no such table exists. We have chosen Kinkelin's Table, which gives the mean number of days' sickness per annum for each age, because the author has used certain reduction factors to allow for the effect of the various terms for which benefits are granted, one, two, three, six, and nine months, which are the terms for which our Belgian societies most frequently grant their allowances.*

We do not know whether Kinkelin's Table sufficiently exactly reflects the sickness phenomena as they exist in Belgium; and on this point we feel compelled to express a certain reserve. But we think that a table based on Belgian experience would lead to results not differing from those we have obtained to an extent sufficient to affect our conclusions.

(*c*) Rate of Interest.—We have adopted the rate of 3 per-cent because nearly all our friendly societies deposit their funds with the Caisse d'Epargne [Government Savings' Bank], which yields a rate of 3 per-cent.

In matters of theory we have adopted the methods generally indicated in the *Text-Book* of the Institute of Actuaries of Great Britain. As far as possible we adopt the Institute Notation.

Let z_x be the mean number of days of sickness during a year, for persons of age x at the beginning of the year,

* Mr. Kinkelin is of opinion that "it is probable that the number of days' sickness will not diminish in the same proportion for every age, when the duration of the aid is reduced." "But," he adds, "in the absence of more complete material, we shall content ourselves with the following principle, applied to all ages:—When the duration of aid is less than a year, the mean number of days' sickness at any age is arrived at by multiplying the number for the case in which the benefit is for a year, by certain reduction factors, as follows:—

Duration of Benefit	Reduction Factor Male
4 weeks at most	0·321
6 „ „	0·469
9 „ „ 2 months	0·578
13 „ „ 3 „	0·684
26 „ „ 6 „	0·848
39 „ „ 9 „	0·934

And l_x the number living at age x indicated by the mortality table.

If s_x represent the present value of sick allowance of 1 franc per day during all its existence, we shall have, on the assumption that the total allowance is paid at the middle of each year, (1):

$$l_x s_x = v^{\frac{1}{2}}(l_x z_x + l_{x+1} z_{x+1} v + l_{x+2} z_{x+2} v^2 + \dots)$$

whence $$s_x = v^{\frac{1}{2}} \frac{D_x z_x + D_{x+1} z_{x+1} + \dots}{D_x}$$

or $$s_x = \frac{K_x}{D_x} \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

where $$K_x = v^{\frac{1}{2}} \Sigma_x^{\omega} D_x z_x .$$

If the allowance is to cease at age X, we have

$$S_{x\overline{X-x}|} = \frac{K_x - K_X}{D_x} \quad . \quad . \quad . \quad (2)$$

Formulas (1) and (2) will serve to determine the present value of an allowance of *one franc*.

The value of the monthly contributions of one franc payable during life, on the supposition that they are paid at the beginning of each month, will be expressed by

$$1 + 12 a_x^{(12)} \quad . \quad . \quad . \quad . \quad (3)$$

To calculate this expression we have adopted the rates of the Caisse de Retraite, which are indicated by the annuity, payable by monthly instalments, corresponding to 10 francs of capital sunk; this sum includes 9.70 francs for the price of the annuity, and 0.30 francs for expenses.

If, then, we indicate by T_x the rate for age x of the Caisse de Retraite for an immediate annuity, we shall have

$$a_x^{(12)} = \frac{1}{\frac{1}{10} \cdot \frac{100}{97} \cdot T_x} = \frac{9{\cdot}7}{T_x}$$

For a monthly contribution, payable until age X, the present value will be given by the expression

$$1 + 12 a_{x:\overline{X-x}|}^{(12)} - \frac{D_X}{D_x}$$

or $$1 + 12 [a_x^{(12)} - {}_{X-x|}a_x^{(12)}] - \frac{D_X}{D_x}$$

an expression which may be more symmetrically written

$$1 + 12 a_x^{(12)} - \frac{D_X}{D_x} (1 + 12 a_X^{(12)}) \quad . \quad . \quad (4)$$

Formulas (3) and (4) give the value of a monthly contribution of one franc.

As most of the societies grant assurances at death for funeral expenses, we have thought it desirable to calculate the price of the death benefit of one franc by the expression

$$(1+i)^{\frac{1}{2}} \frac{M_x}{D_x} = 1{\cdot}0149 \ \frac{M_x}{D_x}$$

The various elements in question have been worked out by the aid of the following commutation table, the data of which have been combined, for calculation of the values of the monthly contributions, with the figures from the rates of the Caisse de Retraite.

[*For the Commutation Table see pp.* 362 & 363].

The following table shows the present value of a unit of monthly contribution, and the present value of a unit of sick-pay, when the duration of the benefit is a year, and when the right to benefit is limited: first to age 65, secondly to age 70, and thirdly when the right is continued for the whole duration of the life of the member. The present value of a unit at death is also shown.

[*For the Table see pp.* 364 & 365].

By the aid of the foregoing table we can approximately ascertain, in drawing the balance sheet at any given date, the financial condition of an existing society.

We have been able to obtain the necessary information for this purpose in the cases of three societies, which we shall proceed to examine in succession.

These societies are altogether different in point of age—the first was established in 1860, the second in 1882, and the third in 1895.

I. Society Founded in 1860.

This society has fixed its monthly contributions at 0.85 francs. Members are in full benefit after five years. The benefit consists of an allowance of 1.65 francs per day in sickness, together with medical attendance and medicines.

For members of less than five years' standing it grants lesser benefits as under:—

During the	1st	year . . .	1.00 franc
„	2nd	„ . . .	1.25 „
„	3rd	„ . . .	1.35 „
„	4th	„ . . .	1.50 „

Full benefit is granted for the first six months, and half benefit for the following six months. Right of benefit continues for the whole life of members. From the information we have been able to obtain, it appears that this society paid out in 1896, 5,796.00 francs for 3,055 days of sickness, being a mean daily payment of 1.90 franc for each day of sickness, including medical fees, drugs, and sundries.

We have based our calculations on the supposition that the daily sick pay reaches a total of 1.90 francs during one year as a maximum for members of more than five years' standing, and we assume that those of less than five years' membership will have no right to benefit until the end of that term. Our valuation will thus err rather in defect than in excess; besides, we do not possess the data necessary to estimate separately the total outgo for each day's sick pay for each of the classes of members of less than five years' standing.

On the 31 December 1896 the society consisted of 298 members of over five years' standing, and 114 members of less than five years.

The value of the engagements of the society, in respect of members of over five years' standing, we find to be 107,790.68 francs. For members of less than five years (deferred benefits) the value of the engagements is 34,880.18 francs; the total value of the society's engagements, in respect of sick pay, is therefore equal to 142,670.86 francs.

The Society promises, in addition, 50 francs at the death of every member dying after at least five years of membership.

This engagement as respects members who have already accomplished this term is valued at 8,040.95.

As regards the members of less than five years' standing, the engagement to pay 50 francs at death is deferred, and valued at 2,245.95. Thus the present value of the assurances of 50 francs at death is 10,286.90 francs.

The present value of the members' engagements, that is to say, the value of the contributions of 0.85 francs, we find to be 70,321.94.

The total value, therefore, of the Society's engagements being equal to 142,670.86 *plus* 10,286.90, that is 152,957.76, it follows that the mathematical reserve, or the difference between the present value of the society's engagements and those of the members amounts to 152,957.76 *minus* 70,321.94, that is 82,635.82 francs.

As the society possessed on the 31 December 1896, the date of the valuation, assets amounting to 8,121.95, the balance-sheet at that date may be stated as under :

BALANCE SHEET, 31 December 1896.

Assets.	*Francs*	Liabilities.	*Francs*
Cash and Investments ...	8,121.95	Reserve required by mathematical computation ...	82,635.82
Deficiency	74,513.87		
	82,635.82		82,635.82

Society No. 2. Established 1882.

This society comprised, on 31 December 1897, 454 members.

The monthly contribution is fixed at 1.10 francs.

It grants a total benefit of

2.50 francs during the first two months' sickness,
and 2 francs during the four following months;

or, which is the same thing:

2.00 francs for six months
and a further 0.50 francs during the first two months.

The right of benefit continues for the whole of the life of member.

It also grants a further funeral allowance of 50 francs.

We find the present value of the contributions of all the members to be 103,793.31 francs.

The value of 2 francs sick pay for six months is 138,249.23, and the value of 0.50 francs for the two first months is 23,557.80 francs.

Then, the present value of the funeral pay is 10,609.67 francs; so that the present value of the total engagements of the society amounts to

$$138{,}249.23 + 23{,}557.80 + 10{,}609.67 = 172{,}416.70 \text{ francs.}$$

It follows that the mathematical reserve amounted on 31 December 1897 to

$$172{,}416.70 - 103{,}793.31 = 68{,}623.39.$$

The society possessed on 31 December 1897, 10,578.14 against the above liabilities.

Its balance-sheet at that date appears thus:

BALANCE SHEET, 31 December 1897.

Assets.		Liabilities.	
	Francs		*Francs*
Cash and Investments ...	10,578.14	Mathematical Reserve ...	68,623.39
Deficiency	58,045.25		
	68,623.39		68,623.39

Society No. 3. Established 1895.

This society consisted on the 31 December 1896, of 244 members.

The contribution is 1 franc per month.

It grants a total sick pay of 2 francs a day for six months.

Benefits cease at age 70.

We find the present value of the benefits to be 63,669.86, and the value of the contributions 48,294.41.

The mathematical reserve at 31 December 1896, was therefore

$$63{,}669.86 - 48{,}294.41 = 15{,}375.45 \text{ francs.}$$

The assets in the treasury of this society on 31 December 1896, amounted to 424.66 francs, and the balance-sheet at that date stood thus:

BALANCE SHEET, 31 December 1896.

Assets.		Liabilities.	
	Francs		*Francs*
Cash and Investments ...	424.66	Mathematical Reserve ...	15,375.45
Deficiency	14,950.79		
	15,375.45		15,375.45

These three societies which we have examined from an actuarial point of view, are types of the kind pretty generally adopted in Belgium.

On examination, the foregoing balance-sheets, it must be owned, do not give a very brilliant view of their financial condition.

We make this observation not without a certain amount of regret, and we hope that, following the wise counsels of Mr. Mahillon, our societies will abandon their old errors, and that they will enter upon "a course of rational management of the savings of their members by "periodically instituting a detailed comparison between their future "engagements and the probable liability to sickness of their "members."*

If the great mass of our friendly society managers appear to feel no disquietude about the future of their institutions, and profess, with regard to them, a characteristic optimism, it is quite otherwise with disinterested men who have examined the question by the means furnished by scientific actuarial processes.

We are happy to say (however) that a tendency is observable in official quarters to adopt rational methods. The law of 1894 has reformed the composition of the Permanent Commission of Friendly Societies, and has made the introduction of two actuaries compulsory. The same law, by Article 34, prescribes that tables of risks, appropriate to the needs of our societies, shall be prepared under the supervision of the Government. The Permanent Commission, moreover, in its last report, expresses itself as follows:

"It is necessary to take more decisive heed to the rational con-"clusions of that science, which demands that we adopt the principle "of equating receipts and payments, and not to confound the "*ordinary* resources (entrance fees, contributions of benefit members "and the interest arising from these funds) with resources of an "*extra*-ordinary nature (such as subscriptions from honorary members "and benefactors, donations, legacies, subventions, and the interest "they produce).

"The payments of benefit members must be made to corres-"pond with the obligations which the societies contract in respect of "them. In other words, the organization of the society must be "based upon the application of tables, showing—

"(*a*) The average number of days' sickness for the different "ages—*i.e.*, the sickness table.

"(*b*) The number who, out of a given number born, attain the "different ages of life—*i.e.*, the mortality table.

"The correspondence between the ordinary receipts and the ordinary "payments must be estimated, not for a few years, but for the total "duration of the society's existence; whether this is to be perpetuated "by the successive admission of new members to replace those who die, "&c., &c., or whether the society is to terminate with the existence "of its members entering at its first formation.

* Note.—See L. Mahillon—On old age pensions for the working classes. Les pensions de retraite ouvrières et les Fonds spéciaux de retraite. P. Weissenbruch. Brussels, 1891.

"To attain this result, it is absolutely necessary that, during the "earlier years, the ordinary receipts should yield a surplus sufficient "to constitute a real reserve fund, to be employed later, according as "the members advance in age, and the average sickness-duration "increases."

We welcome, most gladly, the tendency indicated in the foregoing lines. We see in them an indication of far-reaching reforms which are imperatively necessary in the organization and working of our societies. If scientific principles are not observed, association for mutual support must inevitably fail. Such association must be equitable, and to that end it must also be scientific. To quote Mr. Chaufton, "it must conform to the laws of statistical science; in other words, the laws of number which rule the course of affairs."

Les Sociétés de Secours-mutuels en France.

Par JULES COHEN.

J'aurais pu éprouver quelque embarras à exposer le fonctionnement des sociétés de secours-mutuels dans notre pays et à dévoiler les défauts qui, aux yeux des actuaires, résulteraient de leur organisation ; mais le vote récent par les Chambres de la loi concernant ces sociétés[1] facilite ma tâche en me permettant de signaler les progrès considérables déjà réalisés par les Mutualistes et ceux que l'on est en droit d'attendre du régime plus libéral qui leur sera appliqué.

L'Institut des Actuaires Français ne saurait oublier que son Président fait partie du Parlement auquel nous devons cette loi à laquelle il a activement collaboré et je tiens à rendre, ici, à l'Honorable Monsieur Guieysse, l'hommage qui lui est dû.

I.

Jusqu'à ce jour les sociétés de secours-mutuels ont formé deux groupes :

1°. Les sociétés simplement *autorisées* en vertu des dispositions applicables aux associations de toute nature.[2]

Il peut y avoir dans ce groupe des sociétés quelconques, n'ayant que de lointains rapports avec la Mutualité proprement dite, échappant, en tout cas, à toutes les obligations de la surveillance administrative.

2°. Les sociétés *approuvées* qui sont régies par les lois et décrets suivants dont je me borne à donner une rapide analyse :

Décret-loi organique du 16 mars 1852, en vertu duquel de telles sociétés peuvent être créées sur l'avis du conseil municipal après que l'utilité en aura été déclarée par le Préfet.

Ces sociétés se composent—

[1] Proposition de loi relative aux sociétés de secours-mutuels, promulguée le 1er avril 1898.

[2] D'après l'article 291 de notre code pénal, toute association de plus de 20 personnes devant se réunir périodiquement ne pourra se former qu'avec l'autorisation du gouvernement.

De membres honoraires payant des cotisations ou faisant des dons facultatifs sans participer aux bénéfices des statuts ;

De membres participants payant des cotisations prévues par les statuts et devant être réglées d'après les tables de mortalité ou de morbidité approuvés par le gouvernement.

Leur circonscription doit être limitée à la commune ou à des communes voisines comptant chacune moins de mille habitants.

Le nombre des membres participants ne peut excéder celui de cinq cents.

L'article 6 de ce décret-loi impose aux sociétés de secours-mutuels " d'assurer des secours temporaires aux sociétaires malades, blessés ou " infirmes et de pourvoir à leurs frais funéraires."

La Caisse des Dépôts et Consignations bonifie un intérêt de $4\frac{1}{2}\%$ aux fonds qu'elles doivent y verser.

Décret du 26 avril 1856.—Les sociétés approuvées peuvent affecter une portion de leur capital à la constitution d'un fonds de retraite qui leur est ouvert à la Caisse des Dépôts et Consignations, et productif d'intérêt au taux de $4\frac{1}{2}\%$.

Les pensions sont servies par la *Caisse Nationale des Retraites pour la Vieillesse*, soit à capital aliéné, soit à capital réservé ; les subventions provenant de l'État étant seules inaliénables.

Pour être pensionné un membre doit avoir au moins 50 ans d'âge et dix années de sociétariat.

La pension ne peut être inférieure à 30 francs ni supérieure à dix fois le montant de la cotisation annuelle.

Enfin la loi du 11 juillet 1868 leur permet de contracter annuellement et de renouveler indéfiniment des assurances collectives en cas de décès au nom de tous leurs membres pour un capital maximum de 1,000 francs.

D'après le décret du 28 novembre 1890 les cotisations annuelles doivent dépendre d'un coefficient propre à chaque société et déduit de sa mortalité moyenne pendant les cinq dernières années.

II.

Une telle législation avait le grave inconvénient de ne pas être en harmonie avec les institutions qu'elle devait règlementer ; elle engageait la responsabilité de l'État sans lui fournir les moyens d'intervenir efficacement. Celui-ci a pu encourir le reproche de n'avoir jamais produit de tables de morbidité destinées à éclairer ses administrés sur cette question si importante des indemnités à garantir en cas de maladie. Il faut bien le reconnaître, d'ailleurs, si nos sociétés de secours-mutuels ont toujours fourni avec soin leur situation arrêtée correctement au point de vue comptable, on s'est peu occupé de leur fonctionnement technique et leurs statuts, ainsi que leur interprétation, ont pu exposer à de graves mécomptes.

Cette situation résulte d'une sorte de confusion qui, chez certains mutualistes, a longtemps existé entre la *Mutualité* et la *Bienfaisance* et sur une opinion erronée que n'ont cessé de combattre les économistes et les actuaires les plus éminents lesquels ont ainsi rendu à cette cause des services qu'il est équitable d'apprécier.

Quel est le but poursuivi par les sociétés de secours-mutuels sinon, évidemment, celui de répartir sur un grand nombre d'adhérents les charges que ne pourrait supporter isolément chacun d'eux ?

Les associés se sont réunis pour se porter *mutuellement secours*, s'entr'aider *mutuellement*.

On se groupe dans un esprit de *prévoyance* mais, trop souvent, l'organisation de ces sociétés en fait des institutions où l'assurance se confond avec *l'asssistance* et la *bienfaisance*.

Si les dons des membres honoraires, les subventions de l'État, les attributions de toute sorte dont bénéficient les sociétés de secours-mutuels présentent un intérêt indiscutable, c'est à la condition de ne s'exercer que dans certaines limites afin de témoigner de l'appui, de l'encouragement qu'il est indispensable de leur fournir. Mais il ne faudrait y voir que des avantages accessoires ne faussant pas leur véritable caractère.

Les cotisations des membres participants sont destinées à leur donner des *droits* aux indemnités auxquelles elles doivent correspondre assez exactement, pour satisfaire l'amour propre et la susceptibilité legitime des sociétaires. Nous ne nous trompons pas en affirmant que ce sont bien là les sentiments dont sont animés les mutualistes en général car de nombreuses protestations se sont élevées parmi eux lorsqu'il a pu être question de les confondre, pour ainsi dire, avec l'assistance publique en les plaçant sous la même Direction, au Ministère de l'Intérieur.

Le but des sociétés de secours-mutuels étant de fournir l'assurance à bon marché aux travailleurs peu fortunés, leur fonctionnement doit être le même que celui d'une compagnie d'assurance philanthropique qui, retranchant de ses primes le *chargement* destiné à lui procurer un bénéfice, se bornerait à ne réclamer que le prix pur du risque couru ou des engagements souscrits par elle. L'assistance n'a rien à voir dans une semblable organisation et ce qui, pour nous, caractérise surtout les sociétés de secours-mutuels considérées comme des institutions d'assurance et de prévoyance devant se subvenir à elles-mêmes, c'est ce sentiment si louable de fraternité qui anime leurs membres, qui les porte à se solidariser avec leurs camarades atteints et à leur apporter, dans les épreuves, cet appui moral qui est la véritable raison d'être de ces associations.

Quant à l'intervention de l'État, elle n'est justifiée, à mes yeux, que si elle se borne au contrôle, à la surveillance pouvant prévenir les erreurs auxquelles est exposée l'ignorance. Il est prudent, en général et ici comme partout, de se mettre en garde contre les malversations et de présenter des garanties de gestion honnête (nous reconnaissons volontiers que ces garanties existent au plus haut degré dans ces associations fraternelles), mais il faut aussi éviter les déboires d'une gestion inexpérimentée, imprudente, alors même qu'elle reposerait sur les meilleures intentions.

Les pouvoirs publics en France se sont, à plusieurs reprises, préoccupés de la situation de nos sociétés de secours-mutuels et des dangers que pourraient leur faire courir des évaluations imprudentes.

En 1889, M. le Ministre de l'Intérieur constitua une commission chargée d'examiner leur comptabilité et d'étudier les moyens d'y faire apparaître la valeur des engagements et des ressources correspondantes.

Cette commission, composées des économistes et mutualistes les plus compétents, choisit comme rapporteur notre éminent collègue M. Léon Marie, qui me permettra de dire, en sa présence, qu'il s'est affirmé, dans cette circonstance, avec une autorité indiscutable. Son rapport est une œuvre aussi claire et complète qu'on peut le souhaiter, et c'est sans réserve que je m'associe aux conclusions que je voudrais citer complètement si l'espace ne m'était mesuré. Je me contenterai, à regret, de n'en extraire que les points les plus saillants indiquant les principaux *desiderata* relatifs aux règles à suivre pour l'organisation et la gestion des sociétés de secours-mutuels :

Nécessité de l'application des principes scientifiques (surtout en ce qui concerne les opérations à long terme) comme dans les associations financières pratiquant les opérations analogues.

Le fonctionnement essentiel de la société doit reposer sur les cotisations des membres participants représentant les seules ressources certaines.

Ces cotisations doivent être adéquates aux charges probables.

Il y a lieu de distinguer entre les retraites garanties et les pensions éventuelles. Ces dernières dépendent des ressources extraordinaires et sont subordonnées aux disponibilités de l'exercice. Les retraites garanties, au contraire, constituent un droit et ne peuvent être gagées que sur des cotisations spéciales exactement prévues dans les statuts.

Elles seront, de préférence, constituées à capital aliéné.

L'assurance en cas de décès (qui n'est encore pratiquée que sous la forme collective) viendra heureusement compléter la prévoyance du chef de famille et devra être règlementée avec la même précision que les retraites garanties.

L'assurance *maladie* peut être exploitée par une petite société mais il est indispensable d'étendre la circonscription des sociétés faisant la retraite et l'assurance en cas de décès ou en cas de vie. Pour opérer avec une sécurité suffisante en observant un assez grand nombre de membres, nécessité de recourir à une grande Caisse avec le livret individuel ou, mieux, d'organiser des *Unions* de Sociétés.

Distinction, dans les comptes et inventaires, des différentes branches (assurances en cas de maladie, de décès, retraites garanties etc.), qui doivent avoir, avec des ressources propres, un fonctionnement autonome.

Nécessité des évaluations techniques et des réserves pour les retraites garanties chaque fois qu'on ne fera pas usage du livret individuel des caisses nationales de retraites ou d'assurances.

Cette rapide énumération donnera une idée de l'importance des questions traitées dans ce remarquable rapport, et de la compétence avec laquelle elles ont été résolues.

Nous devons encore à l'intervention d'une autre autorité les heureux résultats obtenus en faveur des sociétés de secours-mutuels. *La Ligue Nationale de la Prévoyance et de la Mutualité*, qui a l'honneur d'être présidee par l'honorable M. Lourties le distingué rapporteur de la loi devant le Sénat, chargea une délégation composée de M. Cheysson, Président du comité technique de la Ligue, et de M. Léon Marie, de soutenir les intérêts de la Mutualité devant la commission parlementaire d'assurance et de prévoyance sociales.

Dans sa déposition du 23 février 1894 M. Cheysson a éloquemment

développé les théories mutualistes et insisté sur chacun des articles du projet de loi alors à l'étude.

De tels efforts ne devaient pas rester stériles. Nos législateurs ont été assez bien inspirés pour adopter des conclusions si bien appuyées et, grâce au précieux concours de l'honorable M. Audiffred, Rapporteur devant la Chambre des Députés, la mutualité française est enfin en possession d'une législation qui, en l'affranchissant des entraves d'un régime suranné, favorisera son développement et assurera sa marche.

III.

Je voudrais, dans un résumé assez clair, indiquer quelle sera la situation nouvelle des sociétés de secours-mutuels.

La loi du 1er avril 1898, s'inspirant des idées les plus libérales, permet aux sociétés de secours-mutuels de se créer sur une simple déclaration des noms des fondateurs et administrateurs avec dépôt des statuts à la sous-préfecture.

Il n'y a plus à craindre l'arbitraire administratif ni à subir les "*conditions qu'il plaira à l'autorité publique d'imposer à la société*" comme le mentionne l'article 291 du code pénal. La seule condition requise sera celle de se conformer à la loi qui trace un programme assez vaste pour que satisfaction soit donnée à toutes les aspirations.

Les sociétés de secours-mutuels pourront, en effet, assurer aux membres participants et à leurs familles des secours en cas de maladie, blessures, infirmités ; leur constituer des pensions de retraite, contracter à leur profit des assurances individuelles ou collectives en cas de vie, de décès ou d'accidents ; pourvoir aux frais funéraires etc.

Elles pourront en outre accessoirement créer des cours professionnels, des offices gratuits de placement et même accorder des allocations en cas de chômage.

Bien entendu ces différentes branches ne sauraient être exploitées suivant les intentions momentanées de tel ou tel groupe d'administrateurs ; les statuts de chaque société devront déterminer son objet, ses obligations ou engagements, le montant et l'emploi des cotisations, en un mot préciser son mode de fonctionnement. Sous cette réserve que l'on ne peut considérer comme restrictive, elles ont toute liberté d'action.

Telles sont les *sociétés libres* d'après l'expression adoptée.

Elles pourront posséder des valeurs mobilières quelconques, recevoir des dons et legs mobiliers. La possession des immeubles leur sera seule interdite.

Les sociétés de secours-mutuels qui voudront être autorisées à recevoir, dans certaines conditions, des dons et legs immobiliers, acquérir des immeubles, bénéficier de certaines immunités fiscales et subventions, en un mot obtenir l'appui de l'État, devront faire *approuver* leurs statuts par arrêté ministériel et se soumettre à un régime de surveillance destiné à s'assurer qu'elles présentent des garanties d'un certain ordre.

Ici encore elles ne dépendent pas du *bon-vouloir* de l'administration, car l'*approbation* est de droit et ne peut leur être refusée que dans les deux cas suivants :—

1°. Pour non conformité des statuts avec les dispositions de la loi ;

2°. Si les statuts ne prévoient pas des recettes proportionnées aux

dépenses, pour la constitution des retraites garanties ou des assurances de toute nature.

En cas de conflit, d'ailleurs, les sociétés peuvent former un recours devant le Conseil d'État.

Les *sociétés approuvées* ne peuvent placer leurs fonds qu'en immeubles (dans certaines conditions prévues par la loi) et en valeurs mobilières de tout repos ; elles devront spécialiser les cotisations affectées aux retraites à servir et subir la vérification de leurs livres, comptes et inventaires.

En échange de ces obligations, elles auront tous les droits des *sociétés libres*, et jouiront en outre d'avantages considérables résultant du patronage de l'État qui leur accorde la faculté de verser des capitaux à la Caisse des Dépôts et Consignations, soit en compte courant disponible, soit pour alimenter un fonds commun de retraites : elles recevront un taux de 4½% de faveur qui sera maintenu par l'inscription d'un crédit annuel suffisant, au budget du Ministère de l'Intérieur.

De plus, les *sociétés approuvées* recevront une part dans les dotations, allocations, ou subventions spéciales consacrées à encourager la création de retraites, à majorer les petites pensions, à les aider enfin lorsque par suite d'épidemic ou toute autre cause elles seraient momentanément hors d'état de remplir leurs engagements.

Par une disposition très sage, sont exclues de ces faveurs les sociétés assez riches pour allouer des indemnités temporaires supérieures à 5 francs par jour, des pensions supérieures à 360 francs ou qui garantissent des capitaux supérieurs à 3,000 francs.

Enfin un conseil supérieur sera institué pour donner son avis sur toutes les questions concernant le fonctionnement des sociétés de secours-mutuels.

Par une innovation heureuse, la loi nouvelle vise la création d'*unions de sociétés* tant dans le domaine des *sociétés libres* que dans celui des *sociétés approuvées*. Ces "*unions*" dont j'ai déjà parlé en rappelant les *desiderata* exposés dans le rapport de M. Léon Marie, renferment en germe la solution des problèmes considérés comme les plus difficiles jusqu'à présent. Elles permettront de grouper les adhérents sur la tête desquels reposeront des retraites ou des assurances, en nombre assez grand pour que les prévisions de la statistique ne soient pas en défaut au point d'empêcher ou de fausser l'application des tarifs ainsi que cela se voit dans les petites sociétés isolées.

Elles fourniront aussi le moyen de suivre les sociétaires dans leurs changements de résidence sans les exposer aux radiations et déchéances regrettables qui ont été tant de fois signalées.

Nous ne pouvons qu'approuver leur création.

En résumé cette loi est essentiellement libérale. Elle est un monument humain et, à ce titre, il n'est pas impossible d'y trouver quelque point critiquable, mais elle représente un progrès qu'il serait injuste de ne pas constater.

L'organisation et la gestion des sociétés de secours-mutuels seront toujours questions assez délicates ; mais avec un tel instrument, en s'appuyant sur les conseils des amis éclairés qui nous permettent d'espérer que leur compétence et leur dévouement seront encore acquis à une cause aussi grande, la mutualité française va inaugurer un régime favorable à son développement et duquel nous attendons les meilleurs résultats.

TRANSLATION.

On Friendly Societies in France.

By JULES COHEN.

I SHOULD have experienced some difficulty in explaining the working of friendly societies in our country, and of exposing the shortcomings which, in the eyes of actuaries, will develop in their organization. But the recent adoption by the Chambers of the law* dealing with these societies, facilitates my task, and enables me to record the considerable progress already made by mutual assurers, and that further progress which we are justified in expecting to result from the more liberal measures which, in future, will be applied to them.

The Institute of French Actuaries cannot forget that its President is a member of that Parliament to which we are indebted for this law which he actively assisted in framing, and I take the opportunity of offering, here, to the Hon. Mr. Guieysse the congratulations which are his due.

I.

Up to now, friendly societies have formed two groups:—

1st. The societies merely *authorized* in virtue of provisions applicable to associations of all kinds.†

There may be in this group, societies of every kind, having but distant connection with mutual assurance properly so-called, and in any case escaping from all the obligations of administrative supervision.

2nd. *Approved* societies, which are governed by the following laws and decrees, of which I shall limit myself to a brief analysis.

Organic decree, having legal force, of 16 March 1852, under which such societies may be established with the consent of the municipal council after their usefulness has been admitted by the Prefect.

These societies consist—

Of honorary members paying voluntary subscriptions or donations, without participating in the benefits under the rules.

* Act relating to friendly societies, passed 1 April 1898.

† According to Art. 291 of our penal code, any association of more than 20 persons requiring to meet periodically, can be established only under authorization of the Government.

Of benefit members paying the contributions laid down in the rules, and calculated according to mortality and sickness tables approved by Government.

The sphere of operations must be confined to the commune, or to neighbouring communes each containing less than a thousand inhabitants.

The number of benefit members must not exceed five hundred.

Article 6 of this decree requires these friendly societies "to assure temporary assistance to sick, injured, or infirm members, and to contribute to their funeral expenses."

The Caisse des Dépôts et Consignation allows interest at 4½ per-cent on the moneys they must pay in.

Decree of 26 April 1856. Approved societies may apply part of their funds to create a pension fund, which will be kept for them at the Caisse des Dépôts et Consignation, and will produce interest at the rate of 4½ per-cent.

The pensions are provided by the *Caisse National des Retraites pour la Vieillesse* (National Old Age Pension Fund), either with or without return of contributions, but the subventions given by the State are all without return.

To have the right to a pension, a member must be at least 50 years of age, and must have been at least 10 years in the friendly society.

The pension must not be less than 30 francs, nor more than ten times the amount of the annual contribution.

Finally, the law of 11 July 1868 allows them to contract annually and renew indefinitely collective life assurances, in the names of all their members, for a maximum capital sum of 1,000 francs.

According to the decree of 28 November 1890, the annual contributions must depend on a scale, special to each society, and deduced from its mean mortality during the preceding five years.

II.

Such legislation had the serious inconvenience of not being in harmony with the institutions which it was intended to regulate. It placed responsibility on the State without furnishing means of interfering effectively. The State has incurred the reproach of having never prepared sickness tables, with a view to enlighten those under its care on such an important question as the sums to be guaranteed in case of illness. It must be acknowledged, moreover, that if our friendly societies have always furnished with care their returns made out correctly as regards accounts, they have paid but little attention to technical working, and their rules, as well as the interpretation of them, have been open to serious blunders.

This condition arises from a kind of confusion, which, among certain mutual assurers, has for long existed between *mutual assurance* and *benevolence*, and from an erroneous opinion, which the most eminent economists and actuaries have never ceased to combat, and who have thus rendered to the cause services which it is right to acknowledge.

What is the end aimed at by friendly societies, if not that,

evidently, of spreading over a large number of members risks which individually they could not carry.

The members combine to give each other *mutual assistance*, to aid each other *mutually*.

They unite in a spirit of providence, but too often the constitution of these societies turns them into institutions where assurance is confounded with charity and benevolence.

If the donations of honorary members, the State subventions, the subsidiary resources of all kinds which friendly societies enjoy, possess an indisputable importance, it is on condition of not passing beyond certain limits intended to mark the support, the encouragement, which it is indispensable to extend to them. But we must see in these only accessory advantages not destroying their true character.

The contributions of benefit members are intended to give them the *right* to the benefits, to which they must correspond with sufficient closeness to satisfy the legitimate pride and susceptibility of the membership. We are not mistaken in maintaining that these are really the sentiments which animate the mutualists generally, because numberless protests have been raised by them when there has been any question of confounding them as it were with the Poor Law by placing them in the same department at the Home Office.

The purpose of friendly societies being to furnish cheap assurance to poor workers, their working must be the same as that of a philanthropic assurance company, which, knocking off from the premiums the loading intended to provide a profit for itself, confines itself to charging merely the cost of the risk run, of the engagements which it undertakes. Charity has no place in such an organization; and that which for us specially distinguishes friendly societies considered as assurance and provident institutions intended to be self-supporting, is the praiseworthy sentiment of brotherhood which animates their members, which leads them to combine for the relief of their suffering comrades, and to give them in times of trial that moral support which is the real cause of the existence of these associations.

As to State interference, it can, in my opinion, be justified only if it is limited to the control, to the supervision, necessary to prevent the mistakes to which ignorance is exposed. It is generally wise, and most of all here, to guard against malversation, and to provide guarantees of honest management (we acknowledge freely that these guarantees exist in the highest degree in these fraternal associations); but the vexations of inexperienced and imprudent management must also be avoided, even if it were based upon the best intentions.

The public authorities in France have, on several occasions, taken up the question of the position of our friendly societies, and the dangers which might arise from unwise valuations.

In 1889, the Minister of the Interior appointed a commission to examine their accounts, and to study the means of setting out the value of their liabilities and of the corresponding resources.

That commission, composed of the most competent economists and mutualists, chose, to draw up its report, our eminent colleague, M. Léon Marie, who will allow me to say in his presence that under these circumstances he showed himself to be an unquestionable authority on the subject. His report is a work as clear and complete

as could be desired, and it is without reserve that I give my adhesion to the conclusions which I should like to quote in their entirety did space permit. With much regret I must be content to extract the most salient points, showing the principal desiderata relative to the rules to be followed in the establishment and management of friendly societies :—

The necessity of applying scientific principles (especially as regards transactions of long date), as in financial institutions transacting analogous business.

The essential working of the society must be based upon contributions of benefit members representing the only secure resources.

The contributions must be adequate to the probable charges.

It is necessary to distinguish between the guaranteed pensions and the eventual pensions. The latter depend upon extraneous resources, and are dependent on the results of the financial period. The guaranteed pensions, on the contrary, constitute a right, and must be fixed on special contributions exactly set forth in the rules.

They should in preference be subject to contributions without return.

Assurance against death (which hitherto has been practised only in the collective form) will come in, happily, to complete the providence of the head of the family, and must be organized with the same precision as the guaranteed pensions.

Sickness assurance can be carried on by a small society, but it is essential to enlarge the boundaries of a society providing pensions, or assurance against death or in case of life. To work with sufficient security by obtaining enough of members, it is necessary to go individually to a large society, or, better still, to arrange *unions of societies*.

There must be a distinction in the accounts and valuations between the different branches (sickness assurance, life assurance, guaranteed pensions, &c.), which must have, with separate funds, autonomous working.

There must be actuarial valuations, and reserves for the guaranteed pensions always when advantage is not taken of individual certificates of national pension or assurance funds.

This brief enumeration will give an idea of the importance of the questions dealt with in this noteworthy report, and of the skill with which they have been solved.

We owe, also, to the aid of another authority, the happy results attained in favour of friendly societies. The *National League of Thrift and of Mutuality*, which has the honour to be presided over by the respected M. Lourties, the distinguished Reporter to the Senate of the law, remitted to a committee consisting of M. Cheysson, President of the Actuarial Committee of the League, and M. Léon Marie, to advocate the interests of mutuality before the Parliamentary Commission on Assurance and Social Providence.

In his memorandum of 23 February 1894, M. Cheysson eloquently developed the theories of mutualism, and insisted on each of the clauses of the Bill then under consideration.

Such efforts could not be fruitless. Our legislators were wise enough to adopt conclusions so ably supported, and, thanks to the

valuable assistance of the respected M. Andiffred, Reporter of the law to the Chamber of Deputies, mutuality in France is finally in possession of legislation, which, freeing it from the fetters of an obsolete system, will favour its development and ensure its progress.

III.

I should like to summarize, as clearly as possible, the new position of friendly societies.

The law of 1 April 1898, inspired by the most liberal views, allows friendly societies to be established by simply filing at the office of the Sub-Prefect a list of the founders and directors, and a copy of the rules.

There is no longer reason to dread arbitrary officialdom, nor to submit to "such conditions as it may please the public authority to impose on the society", as in the above-mentioned Art. 291 of the Penal Code. The only condition will be to comply with the law, which embraces a programme wide enough to satisfy every aspiration.

Friendly societies may, in fact, assure to benefit members and their families, payments for sickness, injuries, or infirmities; provide for them old age pensions, and contract with them individual or collective assurances in case of life or against death or accident; provide burial money, &c.

They may, moreover, establish, as an accessory, trade courts, free offices for investments, and even make payments in case of loss of employment.

It must, however, be understood that these different branches cannot be carried on according to the passing whim of this or that body of directors; the rules of each society must declare its object, its obligations or engagements, the amount of the contributions and how they are to be dealt with; in a word, must clearly define its mode of action. Under these conditions, which cannot be considered as restrictive, they have full liberty of action.

These are the *Free Societies*, in the words of the expression adopted.

They may possess any kind of personal property, and receive donations and legacies of personal property. Only the ownership of real property is forbidden them.

Friendly societies which desire to be authorized to receive, under certain conditions, donations and legacies of real property, to enjoy certain fiscal immunities and subventions, in a word, to obtain the support of the State, must have their rules approved by Ministerial decree, and must submit to a system of supervision intended to secure that they shall possess guarantees of a certain kind.

Here, again, they do not depend on the goodwill of the administration, because *approval* is a right, and may be refused only on the two following grounds:—

1. If the rules do not comply with the requirements of the law;
2. If the rules do not provide for receipts proportionate to outgo for guaranteed pensions or assurances of every kind.

In case of dispute, moreover, the societies may appeal to the Council of State.

Approved societies may invest their money only in real property (under certain conditions laid down in the law) and in thoroughly sound securities. They must keep separate the contributions intended for pensions, and submit to an examination of their books, accounts, and valuations.

In consideration of these obligations, they possess all the rights of *Free Societies*, and enjoy besides considerable advantages flowing from the patronage of the State, which gives them the opportunity of paying in their monies to the Caisse des Dépôts et Consignation, either to a free current account or to a general pension fund. They have interest at 4½ per-cent allowed them as a favour, which is so maintained by a sufficient annual credit in the budget of the Minister of the Interior.

In addition, *approved societies* will receive a share in the endowments, allowances, and special subscriptions, set aside for the encouragement of the purchase of old age pensions, for the supplementing of small pensions, and finally, for helping them when, through epidemics or any other cause, they find themselves temporarily unable to fulfil their engagements.

By a very wise provision, there are excluded from these favours those societies which are wealthy enough to make temporary allowances of more than 5 francs per day, pensions exceeding 360 francs, or which assure sums exceeding 3,000 francs.

Finally, a Higher Council is to be established to advise on all questions relating to the working of friendly societies.

By a happy innovation, the new law provides for the formation of *unions of societies*, as well among the *free societies* as among the *approved societies*. These *unions*, of which I have already spoken in referring to the desiderata set forth in the Report of M. Léon Marie, contain in germ the solution of problems hitherto considered the most difficult. They will allow of the grouping together of the members on whose lives pensions or assurances have been taken out, in sufficient numbers for the laws of average to come into play, so as not to prevent or to falsify the application of the tables of rates, as takes place in small isolated societies.

They will also afford the means of following the members in their migrations, without exposing them to the unfortunate cancelments and lapses to which attention has so often been called.

We can only approve their formation.

In short, this law is essentially liberal. It is a human achievement, and, this being so, it is not impossible to find in it points open to criticism, but it displays progress which it would be unjust not to acknowledge.

The establishment and management of friendly societies will always be very delicate matters; but with such an implement, and in leaning upon the counsels of enlightened friends who will allow us to hope that their skill and their devotion will always be at the disposal of so great a cause, French mutuality will enter on an era favourable to its development, and from which we anticipate the best results.

Die deutsche Arbeiterversicherung ihre Entwickelung und Wirkung.

Von HEINRICH UNGER,

Versicherungstechniker zu Neu-Weissensee bei Berlin.

A. Allgemeines.

Die Arbeiterversicherung an sich ist in Deutschland kein Kind der neuesten Zeit, wie manche annehmen. Schon seit etwa einem Jahrhundert bestehen wohlorganisirte Kassen, welche sich mit der Versicherung der Arbeiter befassen und der gesetzlichen Einführung der Arbeiterversicherung vorgearbeitet haben, wie z. B. von älteren Einrichtungen die gewerblichen Hilfskassen (Innungskassen etc.) und die Knappschaftskassen, von neueren Einrichtungen besonders die Kassen der Deutschen Gewerkvereine "Hirsch-Duncker." Die Anfänge der älteren Kassen reichen vielfach bis in das vorige, ja sogar bis in das 17. Jahrhundert zurück.

Aber erst der neuesten Zeit war es vorbehalten, das gewaltige Werk zu schaffen, welches die deutsche Arbeiterversicherung heute darstellt. Zwar war schon durch die Gewerbeordnung und einzelne andere Gesetzesvorschriften eine Art Zwangsversicherung für einen Theil der Arbeiter in den gewerblichen Hilfskassen, Innungskassen, Knappschaftskassen geschaffen worden, zwar hatte auch in Folge des Haftpflichtgesetzes (Gesetz, betreffend die Verbindlichkeit zum Schadenersatz für die bei dem Betriebe von Eisenbahnen, Bergwerken etc. herbeigeführten Tödtungen und Körperverletzungen, vom 7. Juni 1871) ein grosser Theil der Arbeitgeber, besonders alle grösseren, ihre Arbeiter bei den privaten Versicherungsgesellschaften gegen Haftpflicht oder gegen Haftpflicht und Unfall im Allgemeinen zusammen (Collectivversicherung) versichert. Wie wenig aber diese zum Theil freiwillige Versicherung Allgemeingut wurde, beweisen folgende Zahlen. In *Preussen* waren z. B. im Jahre 1880 (also *vor* dem Inkrafttreten des Kranken-Versicherungsgesetzes vom 15. Juni 1883) rund 1,300,000 Personen, im Jahre 1885 (also gleich *nach* dem Inkrafttreten dieses Gesetzes) rund 2,200,000 Personen gegen Krankheit versichert, was ein Mehr von 900,000 Versicherten ergiebt, und im Jahre 1893, d. h.

nach dem Inkrafttreten der Novelle zum Kranken-Versicherungsgesetze vom 10. April 1892 waren sogar rund 3,700,000 Versicherte vorhanden. Dabei ist die Krankenversicherung stets noch die beliebteste und gebräuchlichste Arbeiterversicherung gewesen. Deshalb halte ich für die Arbeiterversicherung den Versicherungszwang für unbedingt nothwendig. Die absolute Freiwilligkeit des Versicherungswesens ist ja vom idealen Standpunkte sehr wünschenswerth aber auch, wie alle Ideale, nur beschränkt durchführbar. Ihre Undurchführbarkeit hat sich hervorragend in der *Arbeiterversicherung* ergeben. Eine freiwillige Arbeiterversicherung wird stets, wie obige Zahlen ergeben, an der Nachlässigkeit und mangelhaften Einsicht der betheiligten Kreise Schiffbruch leiden; diese Erfahrung ist selbst in der Schweiz gemacht worden, deren Arbeiter für die soziale Selbsthilfe äusserst empfänglich und vorgebildet sind.

Zu dieser Erkenntniss hatte sich denn auch nach und nach die Deutsche Reichsregierung durchgerungen. Man hatte einsehen gelernt, dass die Arbeiterverhältnisse, ebenso wie die sonstigen socialen Verhältnisse im Laufe der Jahre andere geworden waren, dass das Abhängigkeitsverhältniss zwischen Arbeitgeber und Arbeitnehmer nicht mehr von dem patriarchalischen Geiste getragen wurde, wie vielleicht vor 50 Jahren, ehe durch die Gewerbefreiheit, Koalitionsfreiheit, Freizügigkeit, sowie durch die Einwirkungen der Concurrenz auf dem Weltmarkte und der socialdemokratischen Agitationen und endlich durch das Anwachsen der Fabriken und den entsprechenden Verfall des Kleinhandwerkes das Verhältniss der Arbeiter zu ihren Brotherren ein persönlich freieres, dafür aber auch ein kühleres und das Gefühl der Zusammengehörigkeit entbehrendes geworden war. Hierdurch war das Gefühl des Arbeitgebers, dass er für den Arbeiter, dessen Arbeitskraft er ausgenutzt, im Alter, bei Krankheits- oder Unglücksfällen bis zu einem gewissen Grade eine moralische Fürsorgepflicht übernommen hatte, mehr und mehr geschwunden, ohne dass an seine Stelle ein anderer Factor getreten wäre. Denn die öffentliche Armenpflege hat stets etwas Entwürdigendes an sich und beschränkt die Individualität des Arbeiters, indem sie ihm einen Theil seiner politischen Rechte nimmt. Ausserdem dient sie auch nicht zur Erhaltung der wirthschaftlichen, sondern nur der persönlichen Existenz. Diese Hilfslosigkeit der arbeitenden Klassen in Nothfällen war aber vom socialpolitischem Standpunkt von entschiedener Bedeutung. Die Öffentlichkeit, die Allgemeinheit, welche durch die unzufriedenen Arbeitermassen beunruhigt, wenn nicht gar gefährdet war, wurde daher gezwungen zu jenen socialen Missständen Stellung zu nehmen. Für die Hilfslosigkeit der einzelnen Individuen trat der Staat (die Allgemeinheit) als Träger der allgemeinen Kulturaufgaben ein. Mit kurzen Worten hat der damalige Reichskanzler Fürst Bismarck die von den Arbeitern an die Allgemeinheit zu stellenden Forderungen in der Reichstagssitzung vom 9. Mai 1884 präcisirt, indem er erklärte: "Geben Sie dem Arbeiter das Recht auf Arbeit, solange er gesund ist; "sichern Sie ihm Pflege, wenn er krank ist; sichern Sie ihm Versorgung, "wenn er alt ist!'"

Die Reichsregierung ergriff daher die Initiative und legte dem Reichstage zuerst im Jahre 1881 den Entwurf eines Gesetzes, betreffend die Unfallversicherung der Arbeiter vor, mit dem die Reihe der neueren socialpolitischen Gesetzentwürfe eröffnet wurde. Bei der hohen

Bedeutung dieses Schrittes konnte es nicht ausbleiben, dass auch der Monarch, der Hochselige Kaiser Wilhelm I. seinen Standpunkt in der Angelegenheit darlegte, und dies geschah in den nachstehenden herrlichen Worten, mit denen am 17. November 1881 der Reichstag eröffnet wurde:

"Schon im Februar d. J. haben Wir Unsere Überzeugung ausspre-
"chen lassen, dass die Heilung der socialen Schäden nicht ausschliesslich
"im Wege der Repression socialdemokratischer Ausschreitungen,
"sondern gleichmässig auf dem der positiven Förderung des Wohles der
"Arbeiter zu suchen sein werde. Wir halten es für Unsere Kaiserliche
"Pflicht, dem Reichstage diese Aufgabe von Neuem an's Herz zu legen
"und würden Wir mit um so grösserer Befriedigung auf alle Erfolge,
"mit denen Gott Unsere Regierung sichtlich gesegnet hat, zurückblicken,
"wenn es Uns gelänge, dereinst das Bewusstsein mitzunehmen, dem
"Vaterlande neue und dauernde Bürgschaften seines inneren Friedens
"und den Hülfsbedürftigen grössere Sicherheit und Ergiebigkeit des
"Beistandes, auf den sie Anspruch haben, zu hinterlassen. In Unseren
"darauf gerichteten Bestrebungen sind Wir der Zustimmung aller
"verbündeten Regierungen gewiss und vertrauen auf die Unterstützung
"des Reichstages ohne Unterschied der Parteistellungen.

"In diesem Sinne wird zunächst der von den verbündeten Regie-
"rungen in der vorigen Session vorgelegte Entwurf eines Gesetzes über
"die Versicherung der Arbeiter gegen Betriebsunfälle mit Rücksicht
"auf die im Reichstage stattgehabten Verhandlungen über denselben
"einer Umarbeitung unterzogen, um die erneute Berathung desselben
"vorzubereiten. Ergänzend wird ihm eine Vorlage zur Seite treten,
"welche sich eine gleichmässige Organisation des gewerblichen Kranken-
"kassenwesens zur Aufgabe stellt. Aber auch diejenigen, welche
"durch Alter und Invalidität erwerbsunfähig werden, haben der Ge-
"sammtheit gegenüber einen begründeten Anspruch auf ein höheres
"Maass staatlicher Fürsorge, als ihnen bisher hat zu Theil werden
"können.

"Für diese Fürsorge die rechten Mittel und Wege zu finden, ist
"eine schwierige, aber auch eine der höchsten Aufgaben eines jeden
"Gemeinwesens, welches auf den sittlichen Fundamenten des christlichen
"Volkslebens steht. Der engere Anschluss an die realen Kräfte dieses
"Volkslebens und das Zusammenfassen der letzteren in der Form
"korporativer Genossenschaften unter staatlichem Schutz und staatlicher
"Fürsorge werden, wie Wir hoffen, die Lösung auch von Aufgaben
"möglich machen, denen die Staatsgewalt allein in gleichem Umfange
"nicht gewachsen sein würde. Immerhin aber wird auch auf diesem
"Wege das Ziel nicht ohne die Aufwendung erheblicher Mittel zu
"erreichen sein."

Der jetzige Kaiser Wilhelm II, von gleicher Arbeiterfreundlichkeit, wie sein Hochseliger Herr Grossvater erfüllt, hat denn die Erbschaft desselben auch in dieser Beziehung angetreten, indem er bei dem Antritt seiner Regierung bei Eröffnung des Reichstages am 25. Juni 1888 erklärte:

"Ich habe Sie, geehrte Herren, berufen, um vor Ihnen dem
"Deutschen Volke zu verkünden, dass Ich entschlossen bin, als Kaiser
"und König dieselben Wege zu wandeln, auf denen mein Hochseliger
"Herr Grossvater das Vertrauen seiner Bundesgenossen, die Liebe des

" Deutschen Volkes und die wohlwollende Anerkennung des Auslandes " gewonnen hat. Dass auch Mir dies gelinge, steht bei Gott; erstreben " will Ich es in ernster Arbeit. . . . . .

" An der Gesetzgebung des Reichs habe Ich nach der Verfassung " mehr in Meiner Eigenschaft als König von Preussen, wie in der des " Deutschen Kaisers mitzuwirken; aber in beiden wird es Mein " Bestreben sein, das Werk der Reichs-Gesetzgebung in dem gleichen " Sinne fortzuführen, wie Mein Hochseliger Herr Grossvater es begonnen " hat. Insbesondere eigne Ich Mir die von ihm am 17. November 1881 " erlassene Botschaft ihrem vollen Umfange nach an und werde im " Sinne derselben fortfahren, dahin zu wirken, dass die Reichs-Gesetz- " gebung für die arbeitende Bevölkerung auch ferner den Schutz " erstrebe, den sie, im Anschluss an die Grundsätze der christlichen " Sittenlehre, den Schwachen und Bedrängten im Kampfe um das " Dasein gewähren kann. Ich hoffe, dass es gelingen werde, auf " diesem Wege der Ausgleichung ungesunder gesellschaftlicher Gegen- " sätze näher zu kommen, und hege die Zuversicht, dass Ich zur Pflege " unserer inneren Wohlfahrt die einhellige Unterstützung aller treuen " Anhänger des Reichs und der verbündeten Regierungen finden werde, " ohne Trennung nach gesonderter Parteistellung.

" Ebenso aber halte Ich für geboten, unsere staatliche und gesell- " schaftliche Entwickelung in den Bahnen der Gesetzlichkeit zu " erhalten und allen Bestrebungen, welche den Zweck und die Wirkung " haben, die staatliche Ordnung zu untergraben, mit Festigkeit " entgegenzutreten."

In diesen beiden Allerhöchsten Botschaften ist gewissermassen das Grundgesetz der Arbeiterversicherung, die magna charta der ganzen neueren Socialpolitik des Deutschen Reiches enthalten. Bisher sind in sachgemässer Aufeinanderfolge folgende Gesetze neu erschienen bezw. ausgebaut worden:

In der Krankenversicherung:

Hilfkassengesetz vom $\frac{\text{7. April 1876}}{\text{1. Juni 1884}}$,

Krankenversicherungsgesetz vom $\frac{\text{15. Juni 1883}}{\text{10. April 1892}}$.

In der Unfallversicherung:

Unfallversicherungsgesetz vom 6 Juli 1884,

Gesetz über die Ausdehnung der Unfall- und Krankenversicherung vom 28. Mai 1885,

Gesetz, betreffend die Unfall- und Krankenversicherung der in land- und forstwirthschaftlichen Betrieben beschäftigten Personen, vom 5. Mai 1886,

Gesetz, betreffend die Unfallversicherung der bei Bauten beschäftigten Personen, vom 11. Juli 1887,

Gesetz, betreffend die Unfallversicherung der Seeleute und anderer bei der Seeschifffahrt betheiligter Personen, vom 13. Juli 1887,

Gesetz, betreffend die Fürsorge für Beamte und Personen des Soldatenstandes in Folge vom Betriebsunfällen, vom 15. März 1886.

In der Invaliditäts- und Altersversicherung:

Gesetz, betreffend die Invaliditäts- und Altersversicherung, vom 22. Juni 1889.

Unter diese Gesetze fallen gegenwärtig etwa 18,000,000 bis 19,000,000 versicherte Personen beiderlei Geschlechts und der verschiedensten Altersstufen, vom Kinde bis zum Greise, so dass, da die Bevölkerung des Deutschen Reiches nach der Volkszählung von 1895 rund 52,000,000 Personen umfasst, über ein Drittel der ganzen Bevölkerung bezw. über zwei Drittel der nach der Berufszählung von 1895 auf rund 24,253,000 Personen festgestellten erwerbsthätigen Bevölkerung der Arbeiterversicherung unterliegt.

Was nun den Nutzen der Arbeiterversicherung im Allgemeinen anbetrifft, so darf nicht gering der Ausgleich angeschlagen werden, den dieselbe für die Auswüchse der Freizügigkeit dadurch bietet, dass ein Theil der alten oder invaliden Arbeiter nach Erlangung der Rente meist billigere Orte (die Heimath etc.) aufsucht. Ist also der zum Theil von dem platten Lande den Industrieorten zugewanderte Arbeiter verbraucht, dann kann er sich mit seiner Rente wieder nach dem platten Lande zurückziehen und belastet so auf diese Weise wenigstens den grossen Ort nicht mehr, während in dem kleinen ländlichen Orte, der kleinen Provinzialstadt, wo das *baare* Geld eine grössere Bedeutung hat, die Rente dem alten Arbeiter immerhin einen bescheidenen Lebensunterhalt gewährt, in der Haushaltung eines Angehörigen aber von verhältnissmässig hohem Werthe ist, besonders wenn der Rentenempfänger sich noch durch kleine Dienstleistungen (Aufpassen auf die Kinder, Füttern des Viehes etc.) nützlich machen kann und dadurch den Angehörigen das Aufsuchen von Arbeit ausser dem Hause ermöglicht.

Dieses Entlasten der grossen Orte von verbrauchten Kräften dient auch, wie es von vornherein angenommen wurde, zur Entlastung der Armenverbände, denn ein grosser Theil der Krankengeld- und Rentenempfänger würde der öffentlichen Armenpflege anheimfallen. Zwar ist dieser günstige Einfluss für die Armenverbände noch nicht allzu fühlbar geworden, weil die Arbeiterversicherung und speciell die Invaliditäts- und Altersversicherung erst verhältnissmässig zu kurze Zeit besteht, und weil durch die Novelle zum Unterstützungswohnsitz-Gesetz vom 12. März 1894 theilweise eine Vermehrung der Armenlasten eingetreten ist, aber der günstige Einfluss der Arbeiterversicherung auf die Armenpflege hat sich bemerkbar gemacht und das genügt vor der Hand. In Berlin waren z.B. bis 1893 unter ca. 1,600 Rentenempfängern 150 in der Armenpflege. Hiervon blieben 42 Personen mit 5,800 M. Almosen neben 5,780 M. Renten in der Armenpflege. 25 Personen mit 2,820 M. Almosen schieden gänzlich aus und 83 theilweise, nämlich von 14,000 M. Almosen auf 8,600 M. also mit 5,400 M. Ermässigung. Es zeigt sich also hier eine durch die Arbeiterversicherung veranlasste Ersparniss von rund 8,000 M. jährlich, obwohl aus Gründen der Humanität nur verhältnissmässig wenigen Rentenempfängern die früher gewährte Armenunterstützung gänzlich entzogen worden ist. Wie gross thatsächlich die Ersparniss war bezw. ist, steht nicht fest, da die Beobachtung nicht alle Rentner umfasste. 6 Rentner mit 636 M. Almosen neben 1,060 M. Rente fielen *nach* dem Rentenbeginn der Armenpflege anheim. Ein ähnliches Resultat hat die ganze im Jahre 1891 vom "Deutschen Verein für Armenpflege und Wohlthätigkeit" veranstaltete Erhebung ergeben. Bei derselben wurden 378 Armenverwaltungen befragt, von denen 110 antworteten,

darunter 44 grössere, 31 mittlere, 18 kleinere Städte und 17 Landgemeinden in den verschiedensten Theilen ganz Deutschlands. Der überwiegend grösste Theil aller dieser Orte hat eine, häufig erhebliche Verminderung der Armenlasten durch die Socialversicherung bejaht, nur wenige haben eine solche verneint oder die Frage offen gelassen. Am wenigsten haben eine derartige Rückwirkung der Socialversicherung natürlich die kleineren Landgemeinden wahrgenommen, die ohnehin nur geringfügige Armenlasten haben. Einige Orte meinen Allerdings, dass das gesteigerte Maass von Fürsorge, welches durch die Arbeiterversicherungsgesetzgebung den arbeitenden Klassen zu Theil wird, nicht ohne Einfluss auf die Lebenshaltung der breiten Massen der Bevölkerung geblieben ist und bleiben kann, und dass dieser Einfluss sich auch bei der Armenpflege fühlbar macht. Aber dieser Einfluss ist vom socialen, sittlichen und hygienischen Standpunkte zu begrüssen, da er eine Verbesserung der socialen, sittlichen und hygienischen Verhältnisse in sich schliesst. Verbessert worden sind durch die Arbeiterversicherung, wie ein grosser Theil der befragten Orte hervorhebt, insbesondere die Krankenhausverhältnisse, welche vielfach sehr im Argen lagen.

Dass die Arbeiterversicherung, indem sie den Arbeitern in Nothfällen einige Sicherheit verlieh, nicht etwa, wie von einigen Gegnern behauptet wird, unwirthschaftlich gewirkt hat, beweist ihr Einfluss auf die Sparkassenverhältnisse. Die Arbeiter haben sich durch die Aussicht auf Krankengeld, Rente etc. keineswegs mehr als früher vom Sparen abhalten lassen; im Gegentheil die Sparverhältnisse haben sich gebessert, wie die nachstehende Tabelle zeigt.

In Preussen waren vorhanden

Im Jahre	Bei einer Einwohnerzahl von	Sparkassenbücher	Mit einer Gesammteinlage von Mark	Es entfielen also	
				ein Sparkassenbuch auf je . . . Einwohner	auf jeden Einwohner gesparte Mark
1	2	3	4	5	6
1870	24,689,000	1,392,000	495,650,000	18	20
1875	25,742,000	2,209,000	1,112,080,000	12	43
1880	27,279,000	2,942,000	1,594,620,000	9	58
1885	28,318,000	4,209,000	2,260,930,000	7	80
1890	29,958,000	5,593,000	3,281,571,000	5	110
1894	31,848,000	6,527,000	4,000,460,000	5	126

Von diesen Sparkassenbüchern und Spareinlagen entfällt ein nicht geringer Theil auf die Arbeiter und sonstigen sogenannten kleinen Leute (kleinen Handwerksmeister, kleinen Geschäftsleute), welche zum grössten Theile der Arbeiterversicherung unterliegen. So entfielen von 6,491,573 Sparkassenbüchern des Jahres 1894, von denen der Einlagebetrag ermittelt werden konnte, 29·16% auf Bücher bis zu 60 M., 16·04% auf solche von über 60 bis 150 M., 14·12% auf solche von über 150 bis 300 M., 15·42% auf solche von über 300 bis 600 M., endlich 25·26% auf solche von über 600 M. Der Grund für dieses Zunehmen der Sparsamkeit liegt wohl darin, dass das Spargeld mit der zu erwartenden Rente zusammen dem Arbeiter jetzt ein einigermassen sorgloses Alter sichert, während früher das geringe Spargeld allein ihm nicht viel nützen konnte.

Welchen zahlenmässigen Nutzen die Arbeiterversicherung den Arbeitern bringt, geht daraus hervor, dass nach einer Statistik, welche die Jahre 1885 bis 1896 umfasst, in diesem Zeitraum an Krankengeld und fortlaufenden Renten insgesammt gezahlt worden sind 1,243,763,965 M. An Beiträgen haben gezahlt die Arbeitgeber 969,742,016, die Arbeiter 887,865,084 M.; die Arbeiter haben also 355,898,881 M. mehr erhalten als beigesteuert. Zwar ist die Durchführung der deutschen Arbeiterversicherung bisher nicht ohne grosse Opfer auch seitens der Arbeitgeber möglich gewesen; aber einmal kann den Letzteren unmöglich eine gewisse moralische Verpflichtung zur Fürsorge für die von ihnen ausgenutzten Arbeiter abgesprochen werden. Dann aber ist auch das Endziel der Arbeiterversicherung, den Arbeiter möglichst frei zu machen von der wirthschaftlichen Lage und der persönlichen Fürsorge seines Arbeitgebers, ihm das Bewusstsein seiner eigenen Kraft zu geben und ihn dadurch zur Sparsamkeit zu erziehen, ihn durch eine rationelle Fürsorge in den Stand zu setzen, in Nothfällen sein und seiner Familie Leben zu fristen und einem sorglosen Alter entgegenzusehen, sowie endlich ihn durch alles dieses zufriedener zu machen, eine Aufgabe, die wohl würdig ist, dass die Meistbetheiligten—Industrie, Landwirthschaft und Handel—zur Durchführung desselben ihre Kräfte anspannen.

Ist vorstehend die deutsche Arbeiterversicherung im Allgemeinen behandelt worden, so sollen in den nachfolgenden Abschnitten die einzelnen Arten derselben einer näheren Betrachtung unterzogen werden.

B. Krankenversicherung.

Die Krankenversicherung ist in Deutschland die älteste organisirte Personalversicherung; sie reicht in ihren Anfängen verschiedene Jahrhunderte zurück. Und zwar sind es besonders zwei Organisationen, aus denen sich das gewerbliche Krankenkassenwesen entwickelt hat, nämlich die Knappschaftskassen und die Gesellenkassen (später gewerblichen Hülfskassen).

Die älteste Einrichtung sind die Knappschaftskassen, früher auch Büchsenkassen genannt, zu denen die Bergleute die sogenannten Büchsenpfennige zahlen mussten. Dieselben werden schon in der Kuttenberger Bergordnung vom Jahre 1300 und in der Cölnischen Bergordnung vom Jahre 1669 erwähnt und haben eine besondere Förderung in der Cleve-Märkischen Bergordnung vom Jahre 1766 und in der Revidirten Bergordnung für das Herzogthum Schlesien und die Grafschaft Glatz vom Jahre 1769 erfahren. Heute beruht die Organisation der Knappschaftsvereine und Knappschaftskassen auf dem Allgemeinen Berggesetz vom 24. Juni 1865 in der Fassung der Novelle vom 24. Juni 1892.

Die Gesellenkassen (Gesellenladen) der Innungen (Zünfte) sind fast so alt, wie diese selbst; jedoch erst verhältnissmässig spät haben sie eine solche ausgeprägte Organisation erhalten, wie die Knappschaftskassen, ohne aber jemals deren Bedeutung erlangt zu haben. Nachdem nach Einführung der Gewerbefreiheit die Innungen mehr und mehr verfielen, wurde den alten Gesellenkassen, um sie vor dem Eingehen zu schützen, eine gesetzliche Grundlage gegeben, und zwar in Preussen zuerst durch die Allgemeine Gewerbeordnung vom 17. Januar 1845, durch die Verordnung vom 9. Februar 1849 und durch

das Gesetz vom 3. April 1854. Diese Vorschriften wurden später in die Gewerbe-Ordnung für den Norddeutschen Bund vom 21. Juni 1869 übernommen und haben erst durch die neuere Arbeiterversicherung eine Abänderung erfahren.

Beide Einrichtungen—Knappschaftskassen und gewerbliche Hülfskassen—beruhten mehr oder minder auf Zwang, wie es bei der Struktur der sie tragenden Organisationen (Knappschaften, Innungen) nicht anders möglich war.

Während nun die Knappschaftskassen bei dem fast ausschliesslich grossem Umfange der Bergwerksbetriebe und der damit Hand in Hand gehenden grösseren Konzentrirung der Arbeiterschaft weiter gediehen und noch heute für den Bergbau die gesetzliche Arbeiterversicherung zum Theil ersetzen, hatten die gewerblichen Hilfskassen (Gesellenkassen) nur in grösseren Orten, besonders in Industrieorten, Bestand, wo noch Innungen bestanden oder eine grössere Anzahl Arbeitnehmer desselben Gewerbes vorhanden war; im Übrigen fristeten sie ein ziemlich unbedeutendes Dasein. Eine Stärkung erfuhren sie im Jahre 1876. Während das Reichsgesetz über die eingeschriebenen Hilfskassen vom 7. April 1876 die Verfassung und Verwaltung eingeschriebener Hilfskassen, welche die gegenseitige Unterstützung ihrer Mitglieder für den Fall der Krankheit bezwecken, des Näheren regelte, gab die neue Fassung der Gewerbeordnung, welche durch das Reichsgesetz, betreffend die Abänderung des Titels VIII der Gewerbeordnung, vom 8. April 1876 geschaffen wurde, den Ortsgemeinden, eventuell auch den grösseren Kommunalverbänden das Recht, durch Statut einerseits die Bildung eingeschriebener Hilfskassen zur Unterstützung von Gesellen, Gehülfen und Fabrikarbeitern etc. anzuordnen und ihre Einrichtung zu regeln, andererseits aber auch den gedachten Betheiligten, welche das 16. Lebensjahr zurückgelegt haben, die Theilnahme an einer solchen officiellen Kasse zur Pflicht zu machen, falls sie nicht die Mitgliedschaft bei einer anderen eingeschriebenen Hülfskasse nachweisen. Zugleich regelte das Gesetz die eventuelle Anmelde- und Beitragspflicht der Arbeitgeber.

Die auf Grund des Hilfskassengesetzes gegründeten Kassen dienten lediglich der Kranken- und Sterbegeld-Versicherung. Ebenso waren sie hauptsächlich für Arbeiter eingerichtet, obwohl auch andere Kassen und Stände die Wohlthaten des Gesetzes in Anspruch nehmen konnten und auch in Anspruch genommen haben. Die wichtigsten und verbreitetsten eingeschriebenen Hilfskassen sind die Kranken- und Sterbekassen der Hirsch-Duncker'schen Gewerkvereine und die auf socialdemokratischen Grundsätzen aufgebauten sogenannten Centralkassen. Die Hirsch-Duncker'schen Gewerkvereine sind insbesondere mit ihren örtlichen Verwaltungsstellen über ganz Deutschland verbreitet und der älteste 1869 gegründete "Gewerkverein der Deutschen Maschinenbau- und Metallarbeiter" hatte 1894 bereits in weit über 400 Orten Verwaltungsstellen. Ein Bild von dem starken Wachsthum dieser Organisation erhält man, wenn man einen Blick in die Statistik derselben wirft: Die sämmtlichen Hirsch-Duncker'schen Gewerkvereine zusammen hatten 1880 nur 530 örtliche Verwaltungsstellen (Ortsvereine) mit rund 21,000 Mitgliedern, während sie im Jahre 1894 schon bereits 1200 Ortsvereine mit 67,000 Mitgliedern verzeichneten. Aber auch die socialdemokratischen Centralkassen haben bedeutenden Umfang. So

hatte die "Allgemeine Kranken- und Sterbekasse der Metallarbeiter (Eingeschriebene Hülfskasse 29 Hamburg)" im Jahre 1889 auch bereits weit über 400 örtliche Verwaltungstellen mit rund 33,000 Mitgliedern. Dieses starke Wachsthum haben die eingeschriebenen Hülfskassen, namentlich die vorerwähnten beiden Gruppen derselben, dadurch erlangt, dass ihre Mitglieder bei Gewährleistung bestimmter Mindestleistungen seitens der Kassen vom Beitrittszwange bei einer Zwangskasse befreit waren. Zu diesem Zwecke erhielten die Hilfskassen in Gemässheit des §75 des Krankenversicherungsgesetzes vom 15. Juni 1883 eine Bescheinigung, welche die Mitglieder den Zwangskassen gegenüber legitimirte. Zugleich war zu dem Hilfkassengesetz vom 7. April 1876 unter dem 1. Juni 1884 eine Novelle erschienen, welche dies Gesetz mehr den neueren Bestimmungen des Krankenversicherungsgesetzes anpasste. Eine noch wesentlichere und es stark erschütternde Abänderung erhielt aber das Hülfskassenwesen durch die Novelle zum Krankenversicherungsgesetze vom 10. April 1892. Während eine freie Hülfskasse früher keine Naturalien (freien Arzt, Medizin, Brillen, Bruchbänder etc.) zu gewähren brauchte, sie diese Leistungen vielmehr durch ein erhöhtes Krankengeld ablösen konnte, die Höhe der Mindestleistungen der Kasse sich auch nach den Festsetzungen und Verhältnissen der Gemeinde, in deren Bezirk die Kasse ihren Sitz hatte, richtete, sind jetzt die Verhältnisse derjenigen Gemeinde massgebend, in deren Bezirk der Versicherungspflichtige beschäftigt ist; ausserdem müssen die eingeschriebenen Hülfskassen jetzt auch, um ihre Mitglieder von der Versicherungspflicht bei den Zwangskassen zu befreien, die obigen Naturalleistungen gewähren. Man kann sich unschwer ein Bild von der Mehrbelastung machen, welche einer Kasse von über 400 Verwaltungsstellen dadurch entsteht, dass die Leistungen fast bei jeder Verwaltungsstelle, ja selbst innerhalb derselben je nach dem Beschäftigungsorte des Versicherten, verschieden berechnet werden müssen, weil die für die einzelnen Orte von den Behörden festgesetzten ortsüblichen Tagelöhne etc., sehr variiren. Die übrigen Verhältnisse der Hülfskassen werden bei der nachfolgenden Darstellung des Krankenversicherungsgesetzes mit besprochen werden.

Unter das Krankenversicherungsgesetz vom 15. Juni 1883 in der Fassung der Novelle vom 10. April 1892 fallen jetzt rund 8,000,000 Personen, welche in rund 22,000 Kassen versichert sind. Nach der Krankenkassen-Statistik für 1895 vertheilen sich dieselben, wie folgt:

Bezeichung der Kassen-Einrichtungen	Anzahl	Anzahl der Mitglieder
1	2	3
Gemeinde-Krankenversicherung	8,449	1,287,650
Orts-Krankenkassen	4,475	3,450,599
Betriebs- (Fabrik-) Krankenkassen	6,770	1,913,917
Bau-Krankenkassen	102	26,566
Innungs-Krankenkassen	545	114,581
Knappschaftskassen[1]	225	484,841
Eingeschriebene Hülfskassen	1,388	671,668
Landesrechtliche Hülfskassen	263	60,543
Zusammen	22,217	8,010,365

[1] Die Knappschaftskassen sind in der officiellen Reichs-Statistik nicht enthalten, die obigen Zahlen beruhen vielmehr auf privaten Angaben.

Die vorstehenden Zahlen sind nur relativ zutreffend, da einerseits die Anzahl der Kassen im Laufe des Jahres durch Eingehen alter und Entstehen neuer schwankend ist, und andererseits verschiedene Personen auch bei zwei Kassen versichert sind.

Dem Versicherungszwange sind unterworfen alle unselbstständigen Personen, welche gegen Gehalt oder Lohn (hierzu gehören auch Naturalien) beschäftigt sind

1. in Bergwerken, Salinen, Aufbereitungsanstalten, Brüchen und Gruben, in Fabriken und Hüttenwerken, beim Eisenbahn-, Binnenschiffahrts- und Baggereibetriebe, auf Werften und bei Bauten;
2. im Handelsgewerbe, im Handwerk und in sonstigen stehenden Gewerbebetrieben, mit Ausnahme der Gehülfen und Lehrlinge in Apotheken;
3. in dem Geschäftbetriebe der Anwälte, Notare und Gerichtsvollzieher, der Krankenkassen, Berufsgenossenschaften und Versicherungsanstalten;
4. in Betrieben, in denen Dampfkessel oder durch elementare Kraft (Wind, Wasser, Dampf, Gas, heisse Luft etc.) bewegte Triebwerke zur Verwendung kommen, sofern diese Verwendung nicht ausschliesslich in vorübergehender Benutzung einer nicht zur Betriebsanlage gehörenden Kraftmaschine besteht;
5. in dem gesammten Betriebe der Post- und Telegraphenverwaltungen;

sofern nicht die Beschäftigung durch die Natur ihres Gegenstandes oder im Voraus durch den Arbeitsvertrag auf einen Zeitraum von weniger als einer Woche beschränkt ist. Die Handlungsgehülfen unterliegen der Versicherungspflicht ausserdem auch nur, wenn durch Vertrag die ihnen im Falle von Krankheit aus dem Deutschen Handelsgesetzbuch zustehenden Rechte aufgehoben oder beschränkt sind.

Durch statutarische Bestimmung einer Gemeinde oder eines weiteren Kommunalverbandes für ihren Verwaltungsbezirk kann die Versicherungspflicht noch erweitert werden auf

1. diejenigen vorbezeichneten Personen, deren Beschäftigung durch die Natur ihres Gegenstandes oder im Voraus durch den Arbeitsvertrag auf einen Zeitraum von weniger als einer Woche beschränkt ist;
2. die in Kommunalbetrieben und im Kommunaldienste beschäftigten Personen, welche nicht ex lege schon versicherungspflichtig sind;
3. diejenigen Familienangehörigen eines Betriebsunternehmers, deren Beschäftigung in dem Betriebe nicht auf Grund eines Arbeitsvertrages stattfindet;
4. selbständige Gewerbetreibende, welche in eigenen Betriebsstätten im Auftrage und für Rechnung anderer Gewerbetreibender mit der Herstellung oder Bearbeitung gewerblicher Erzeugnisse beschäftigt werden (Hausindustrie) und zwar auch für den Fall, dass sie die Roh- und Hülfsstoffe selbst beschaffen,

und auch für die Zeit, während welcher sie vorübergehend für eigene Rechnung arbeiten;

5. Handlungsgehülfen und -Lehrlinge, soweit dieselben nicht ex lege schon versicherungspflichtig sind;
6. die in der Land- und Forstwirthschaft beschäftigten Arbeiter und Betriebsbeamten.

Durch Verfügung des Reichskanzlers bezw. der Landes-Zentralbehörden (Ministerien) kann die Versicherungspflicht auch auf solche in Betrieben oder im Dienste des Reichs oder eines Bundesstaates beschäftigte Personen erstreckt werden, welche nicht ex lege schon versicherungspflichtig sind.

Betriebsbeamte, Werkmeister und Techniker, Handlungsgehülfen und -Lehrlinge, die in dem Geschäftsbetriebe der Anwälte, Notare und Gerichtsvollzieher, der Krankenkassen, Berufsgenossenschaften und Versicherungsanstalten beschäftigten Personen, sowie die in Betrieben oder im Dienste des Reichs, eines Bundesstaates oder eines Kommunalverbandes beschäftigten Personen, soweit sie Beamte sind, unterliegen der Versicherungspflicht jedoch nur, wenn ihr Arbeitsverdienst an Lohn oder Gehalt $6\frac{2}{3}$ M. für den Arbeitstag oder, sofern Lohn bezw. Gehalt nach grösseren Zeitabschnitten bemessen ist, 2000 M. für das Jahr gerechnet, nicht übersteigt.

Weitere Ausnahmen von der Versicherungspflicht theils ex lege theils auf Antrag sind noch für Personen zugelassen, welche für Krankheitsfälle bereits ihrem Arbeitgeber gegenüber einen Rechtsanspruch auf Gewährung der im Krankenversicherungsgesetze bezeichneten Mindestleistungen haben, oder welche in Folge von Gebrechen etc. nur noch beschränkt arbeitsfähig sind.

Für Hausgesinde ist eine Versicherungspflicht nicht vorgeschrieben soweit dasselbe, nicht unter die Begriffe "landwirthschaftliche Arbeiter" oder "Gewerbegehilfen" subsumirt werden kann. Wohl aber kann Hausgesinde der Gemeinde-Krankenversicherung (nicht den organisirten Krankenkassen) freiwillig beitreten.

Die Versicherung mit ihren Rechtsfolgen beginnt mit dem Eintritt in eine die Versicherungspflicht bedingende Beschäftigung ohne Weiteres. Die im Gesetz vorgeschriebene An- und Abmeldung sowie die Beitragszahlung sind nur Folgen der eingetretenen Versicherung. Die Krankenkassen müssen daher einen Arbeiter, der von seinem Arbeitgeber aus Nachlässigkeit nicht angemeldet ist und für den in Folge dessen auch keine Beiträge bezahlt sind, im Krankheitsfalle doch unterstützen, wogegen sie an den Arbeitgeber Regress nehmen können.

Zur Durchführung der Krankenversicherung ist zwar ein Versicherungszwang, nicht aber ein absoluter Kassenzwang angeordnet; nur in sehr beschränktem Maasse kann Letzterer darin gefunden werden, dass nicht *jede* Kasse zur Erfüllung der Versicherungspflicht geeignet ist, derartige Kassen vielmehr bestimmten Vorschriften entsprechen müssen. In erster Linie sollen als Träger der Versicherung

die Ortskrankenkassen,
die Betriebs- (Fabrik-) Krankenkassen und
die Baukrankenkassen

fungiren. Diese sind, wie in der Unfallversicherung die Berufsgenossenschaften und in der Invaliditäts- und Alterversicherung die Versicherungs-

anstalten, dazu berufen, die Geschäfte der Krankenversicherung zu führen. Sofern in einem Orte oder Bezirke eine derartige organisirte Kasse nicht vorhanden, ihre Gründung auch nicht angängig ist, soll subsidiär die Gemeinde-Krankenversicherung eintreten. Während dieselbe in Norddeutschland auch das geblieben ist, was sie sein sollte, nämlich ein Nothbehelf, und sie hier auch nur sporadisch vertreten ist, hat die Gemeinde-Krankenversicherung in Süddeutschland eine sehr starke Verbreitung gefunden. Dies hat darin seinen Grund, dass bereits vor Erlass der socialpolitischen Reichsgesetze in Süddeutschland eine Krankenfürsorge der Gemeinde gegen Beitragserhebung ausgebildet war. Vorbildlich war dafür das bayrische Gesetz, betreffend die öffentliche Armen- und Krankenpflege, vom 29. April 1869, dem sich das badische Armengesetz vom 5. Mai 1870 und das württembergische Ausführungsgesetz zum Reichsgesetze über den Unterstützungswohnsitz vom 23. April 1873 angeschlossen hatten. Indem die süddeutschen Orte zum grossen Theile statt Orts- etc. Krankenkassen die Gemeinde-Krankenversicherung einführten, haben sie also an einen alten Gebrauch, an eine alte Einrichtung angeknüpft; ob dies aber dazu beigetragen hat, die Arbeiterversicherung für die betheiligten Kreise schmackhafter, populärer zu machen, möchte ich doch stark bezweifeln. In der Gemeinde-Krankenversicherung ist nicht eine organisirte Kasse, sondern die Gemeinde selbst Trägerin der Versicherung; die Gemeinde muss also auch das Risico tragen, welches durch eine falsche Berechnung der beiderseitigen Leistungen oder durch eine übergrosse Krankheitshäufigkeit erwächst. Es wird daher der Gemeinde-Krankenversicherung stets etwas von dem Odium der öffentlichen Armenpflege anhaften. Durch die Gemeinde-Krankenversicherung verliert die Krankenversicherung viel von ihrem Character als Versicherung. Neben den vorbenannten organisirten Kassen und der Gemeinde-Krankenversicherung sind noch aus historischen und politischen Gründen

die Innungs-Krankenkassen und
die Knappschaftskassen

zugelassen worden, um die alten und im volkswirthschaftlichen Interesse wichtigen Einrichtungen "Innungen" und "Knappschaften" nicht zu schwächen, sondern um ihnen durch die neueren socialpolitischen Gesetze eine neue Kräftigung in ihrer segensreichen Thätigkeit zu verleihen.

Von der Verpflichtung der Gemeinde-Krankenversicherung oder einer nach Massgabe des Krankenversicherungsgesetzes errichteten Krankenkasse (hierzu gehören die Knappschaftskassen nicht) anzugehören, sind die Mitglieder der auf Grund des Gesetzes über die eingeschriebenen Hülfskassen vom $\frac{7.\text{ April }1876}{1.\text{ Juni }1884}$ errichteten Kassen und der auf Grund landesrechtlicher Vorschriften errichteten Hülfskassen befreit, sofern diese Kassen im Krankheitsfalle mindestens diejenigen Leistungen gewähren, welche von der Gemeinde, in deren Bezirk der Versicherungspflichtige beschäftigt ist, nach Massgabe des Gesetzes zu gewähren sind. Während mit der Gemeinde-Krankenversicherung und den oben bezeichneten organisirten Kassen ein gewisser Beitrittszwang verbunden ist, darf ein derartiger Zwang für den Beitritt zu den eingeschriebenen und den landesrechtlichen Hülfskassen nach der neueren Gesetzgebung nicht mehr vorgeschrieben werden. Insbesondere ist es den Arbeitgebern nicht gestattet, einen derartigen Zwang durch den Arbeitsvertrag oder

auf andere Weise auszuüben; wie es den Arbeitgebern überhaupt untersagt ist, die Anwendung der Bestimmungen des Krankenversicherungsgesetzes zum Nachtheile der Versicherten durch Verträge (mittels Reglements oder besonderer Übereinkunft) auszuschliessen oder zu beschränken.

Weder die Festsetzung der Höhe der Beiträge noch die Abmessung der Leistungen geschieht auf versicherungsmathematischem Wege; beide werden zuerst nach den Erfahrungen der Praxis schätzungsweise angenommen und später je nach Bedarf erhöht oder ermässigt. Die Höhe der Beiträge wird im Allgemeinen nach der Höhe des ortsüblichen bezw. des durchschnittlichen Tagelohnes berechnet. Die von der Gemeinde zu erhebenden Versicherungsbeiträge sollen z. B. $1\frac{1}{2}$ Prozent des ortsüblichen Tagelohnes nicht übersteigen. Sie können, falls sich aus den Jahresabschlüssen ergiebt, dass sie zur Deckung der gesetzlichen Krankenunterstützung nicht ausreichen, mit Genehmigung der höheren Verwaltungsbehörde nur bis zu 2 Prozent des ortsüblichen Tagelohnes erhöht werden. Bei den Zwangskassen tragen von den Beiträgen $\frac{2}{3}$ die Arbeitnehmer, $\frac{1}{3}$ die Arbeitgeber; bei den freiwilligen Kassen tragen die Arbeitnehmer die Beiträge allein.

Die Mindestleistung, welche die Gemeinde-Krankenversicherung gewährt, besteht in

1. freier ärztlicher Behandlung, Arznei sowie Brillen, Bruchbänder und ähnlichen Heilmitteln,
2. im Falle der Erwerbsunfähigkeit vom dritten Tage nach dem Tage der Erkrankung ab einem Krankengelde in Höhe der Hälfte des ortsüblichen Tagelohnes gewöhnlicher Tagearbeiter.

An Stelle der freien ärztlichen Behandlung, der Arznei und des Krankengeldes kann freie Anstaltspflege und die Hälfte des Krankengeldes an alimentationsberechtigte Angehörige gewährt werden.

Die Mindestleistung ist längstens 13 Wochen zu gewähren. Eine gleiche Mindestleistung ist bei den eingeschriebenen und landesrechtlichen Hülfskassen vorgeschrieben.

Bei den übrigen Kassen tritt zu dieser Mindestleistung noch als gesetzliche Krankenunterstützung hinzu

3. eine Wöchnerinnen-Unterstützung auf die Dauer von mindestens 4 Wochen nach der Niederkunft,
4. für den Todesfall ein Sterbegeld im zwanzigfachen Betrage des durchschnittlichen Tagelohnes.

Ausserdem wird das Krankengeld unter Ziffer 2 nach dem durchschnittlichen Tagelohne berechnet.

Eine Erhöhung und Erweiterung der Leistungen der Ortskrankenkassen ist in folgendem Umfange zulässig:

1. Die Krankenunterstützung kann erhöht und auf einen längeren Zeitraum als 13 Wochen festgesetzt werden;
2. nach Beendigung der Krankenunterstützung kann Fürsorge für Rekonvaleszenten, namentlich auch Unterbringung in einer Rekonvalescentenanstalt gewährt werden;
3. die Wöchnerinnen-Unterstützung kann verlängert werden;
4. das Sterbegeld kann erhöht werden;

5. für erkrankte Familienangehörige von Kassenmitgliedern können, sofern dieselben nicht selbst versicherungspflichtig sind, freie ärztliche Behandlung, freie Arznei und sonstige Heilmittel sowie auch Wöchnerinnen-Unterstützung gewährt werden;
6. beim Tode der Ehefrau oder eines Kindes eines Kassenmitgliedes kann sofern diese Personen nicht selbst in einem gesetzlichen Versicherungsverhältnisse stehen, auf Grund dessen ihren Hinterbliebenen ein Anspruch auf Sterbegeld zusteht, ein Sterbegeld gewährt werden.

Auf weitere Unterstützungen, namentlich auf Invaliden-, Wittwen- und Waisen-Unterstützungen dürfen die Leistungen der fraglichen Kassen nicht ausgedehnt werden.

Eine Karenzzeit darf im Allgemeinen nur für freiwillige Mitglieder eingeführt werden, für Zwangsmitglieder höchstens bezüglich der die gesetzlichen Mindestbeträge übersteigenden Kassenleistungen.

Bezüglich der Leistungen der Krankenkassen dürfte es von Interesse sein, einige Relativzahlen über dieselben näher zu betrachten:

Es kamen auf 1 Mitglied der Krankenkassen im Durchschnitt des Jahres 1895:—

bei den	Erkrankungsfälle	Krankheitstage	Krankheitskosten Mark
1	2	3	4
Gemeinde-Krankenversicherungen .	0·3	4·4	7·99
Orts-Krankenkassen	0·4	6·4	13·22
Betriebs-(Fabrik-) Krankenkassen .	0·4	6·8	18·51
Bau-Krankenkassen	0·5	9·8	23·87
Innungs-Krankenkassen . . .	0·3	5·2	11·62
Eingeschriebenen Hülfskassen . .	0·4	6·7	15·80
Landesrechtlichen Hülfskassen . .	0·3	6·5	15·27
Krankenkassen überhaupt . .	0·4	6·2	13·93

Zu den Krankheitskosten gehören die Ausgaben für Arzt, Arznei und sonstige Heilmittel, Krankengeld, Wöchnerinnen-Unterstützung, Sterbegeld, Verpflegungskosten an Krankenanstalten.

Nach dem Durchschnittsergebniss der Jahre 1885 bis 1895 ergeben sich folgende Zahlen:—

Auf 1 Versicherten kommen jährlich Mark					Auf 1 Erkrankungsfall kommen		Auf 100 Versicherte kommen			Auf 100 Mark Krankheitskosten kommen					
Beiträge der		Kosten für		Vermögen	Krankheits-		Erkrankte			Krankengeld	Arzt	Heilmittel	Anstaltspflege	Sterbegeld	Wochenbett
Arbeitgeber	Arbeitnehmer	Krankheit	Verwaltung		Tage	Kosten Mark	männliche	weibliche	überhaupt						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
3·96	10·19	12·61	0·85	10·89	16·4	34·98	37·1	31·9	36·0	46·56	20·45	16·61	10·97	4·00	1·41

Als Unterlage zu den in dieser Arbeit aufgeführten Statistiken haben die Arbeiten des Reichs-Versicherungsamts, des Kaiserlichen Statistischen Amts, des Kaiserlichen Gesundheitsamts und des Königlich Preussischen Statistischen Bureaus gedient.

Die Verwaltungsunkosten betragen in der Krankenversicherung rund 5 % der Gesammteinnahme. Dem Grundsatze der Selbstverwaltung

entsprechend trägt jede Kasse ihre Verwaltungsunkosten selbst; nur bei der Gemeinde-Krankenversicherung fallen dieselben der Gemeinde und bei der Betriebs- und Bau-Krankenkasse dem Unternehmer zur Last.

Um die ordnungsmässige Erfüllung der den Krankenkassen obliegenden Verpflichtungen zu sichern, haben die Gemeinde-Krankenversicherung, Ortskrankenkassen und Innungskrankenkassen einen Reservefonds in Höhe der durchschnittlichen Jahresausgabe der letzten 3 Jahre, die eingeschriebenen Hülfskassen einen solchen in Höhe der durchschnittlichen Jahresausgabe der letzten 5 Jahre anzusammeln. Für die eingeschriebenen Hülfskassen war der Reservefonds ursprünglich nicht vorgeschrieben, dagegen mussten dieselben früher in jedem fünften Jahre die wahrscheinliche Höhe ihrer Verpflichtungen und der ihnen gegenüberstehenden Einnahmen durch einen an der Verwaltung der Kasse nicht betheiligten Sachverständigen (Versicherungstechniker) abschätzen lassen. Ein Schaden kann meines Erachtens aus diesem Wegfall der versicherungstechnischen Prüfungen für die Kassenmitglieder nicht entstehen, da dieselben durch den Reservefonds eine neue Sicherheit erhalten haben. Ebenso wird die fünfjährige Durchschnittsberechnung desselben genügen, da bei grösseren über Provinzen, den ganzen Staat oder gar über das Reichsgebiet sich erstreckenden Kassen durch das Fluctuiren der Arbeiterbevölkerung ein fortwährender Ausgleich stattfindet und bei kleineren lokalen Kassen die Verhältnisse leicht zu übersehen sind. Wünschenswerth wäre es allerdings, wenn für alle Krankenkassen (Zwangs- und freiwillige Kassen) eine solche versicherungstechnische Prüfung, welche vielleicht alle 5 Jahre stattfinden könnte, vorgeschrieben würde, schon damit eine genaue Statistik und damit zugleich die Aufstellung zuverlässiger Morbiditätstabellen ermöglicht würde. Endlich müssen die Kassen alljährlich den Aufsichtsbehörden einen Rechnungsabschluss sowie Übersichten über die Mitglieder, Krankheits- und Sterbefälle, vereinnahmten Beiträge und geleisteten Unterstützungen einreichen, damit die Aufsichtsbehörden an der Hand dieser die Leistungsfähigkeit der Kassen prüfen können.

Die Verwaltungsorgane der Kasse sind die Generalversammlung und der von dieser gewählte Vorstand, welcher die Kasse gerichtlich und aussergerichtlich vertritt und nach Massgabe des Kassenstatuts die laufende Verwaltung derselben führt. Sämmtliche Kassen mit Ausnahme der Gemeinde-Krankenversicherung, welche keine eigentliche Krankenkasse darstellt, haben den Character einer juristischen Persönlichkeit. An sich geschieht die Verwaltung der Kassen durch ihre Mitglieder (Selbstverwaltung), also durch die Arbeitnehmer, doch haben die Arbeitgeber, welche verpflichtet sind, zu der Kasse beizusteuern, Anspruch auf Vertretung im Vorstande und in der Generalversammlung.

Sämmtliche oder mehrere Gemeinde-Krankenversicherungen und Ortskrankenkassen innerhalb des Bezirks einer Aufsichtsbehörde können sich zu einem Verbande vereinigen zum Zweck

1. der Anstellung eines gemeinsamen Rechnungs- und Kassenführers und anderer gemeinsamer Bediensteten (Krankenkontroleure etc.),
2. der Abschliessung gemeinsamer Verträge mit Ärzten, Apotheken, Krankenhäusern und Lieferanten von Heilmitteln und anderer Bedürfnisse der Krankenpflege,

3. der Anlage und des Betriebes gemeinsamer Anstalten zur Heilung und Verpflegung erkrankter Mitglieder, sowie zur Fürsorge für Rekonvalescenten,
4. der gemeinsamen Bestreitung der Krankenunterstützungskosten zu einem die Hälfte ihres Gesammtbetrages nicht übersteigenden Theil.

Auch ein derartiger Verband hat den Character einer juristischen Persönlichkeit. Zur Deckung der Ausgaben müssen die betheiligten Kassen im Laufe des Jahres Vorschüsse leisten, während die Gesammtausgaben am Schlusse des Jahres auf die einzelnen betheiligten Kassen nach Verhältniss der vereinnahmten Kassenbeiträge umgelegt werden.

Die gesetzlichen Verpflichtungen der Armenverbände werden durch die Krankenversicherung nicht berührt.

Die einzelnen Kassen müssen sich gegenseitig Rechtshülfe gewähren.

Zuwiderhandlungen gegen die Vorschriften des Gesetzes sind unter Strafe gestellt.

Eine Besserung hat die Arbeiterversicherung und besonders die Krankenversicherung auf sanitärem Gebiete herbeigeführt. In Familien, in denen früher kein Arzt gesehen wurde, wird jetzt in Folge der durch die Arbeiterversicherung geschaffenen Unentgeltlichkeit der ärztlichen Hülfe und der dazu gehörigen Heilmittel ab und zu der Arzt in Anspruch genommen. Dadurch erlangen die Ärzte und zum Theil auch die Medizinalbeamten (Kreisphysiker, Kreiswundärzte etc.) Einblick in die sanitären Verhältnisse des Ortes, der einzelnen Wohnstätten und deren Bewohner und können in Folge dessen auch weit thätiger bei der Verbesserung der bezüglichen Zustände mitwirken, insbesondere sofern die Gemeinden thatkräftige Hilfe leisten. Die Folge davon ist, dass sich die Volksgesundheit und die soziale Leistungsfähigkeit der Bevölkerung hebt, dass ein frischer Zug in das kommunale Leben hineinkommt, dass die Krankheits- und Sterblichkeitsverhältnisse des Ortes sich günstiger gestalten u.s.w.

Von entschiedener Bedeutung für die bessere und gründlichere Heilung der Krankheiten und besonders der Berufskrankheiten sind die von verschiedenen Krankenkassen bezw. Krankenkassen-Verbänden gegründeten Reconvalescentenanstalten. Was nützt es z. B. bei der Bleikrankheit (chronischen Bleivergiftung), wenn die Kolikanfälle oder Lähmungserscheinungen beseitigt werden, so dass der Kranke vorläufig (d. h. vorübergehend) arbeits- und erwerbsfähig ist, während das Blei im Körper bleibt, oder bei der Lungenschwindsucht, wenn man katarrhalische Anfälle, Husten oder Blutspucken mittels innerlicher Heilmittel vertreibt, während die eigentliche Krankheit mehr oder minder rüstig fortschreitet. Es ist daher der Aufenthalt in Reconvalescentenanstalten, Lungenheilstätten etc., wie sie von den Einrichtungen der socialen Arbeiterversicherung geschaffen sind und immer noch mehr geschaffen werden, ein unbedingtes Erforderniss für eine rationelle Krankheitsbehandlung.

C. Unfallversicherung.

Auf dem Gebiete der gewerblichen etc. Unfälle genügten die alten civilrechtlichen Bestimmungen nicht, um den Verletzten bezw. deren Hinterbliebenen den erlittenen Schaden zu vergüten. Entweder war

der Schaden durch eigene Unvorsichtigkeit entstanden, in welchem Falle ein Recht auf Schadenersatz nicht konstruirbar war, oder den Unfall hatte ein Mitarbeiter bezw. Betriebsbeamter verschuldet, der in der Regel nicht genügend leistungsfähig war, um Schadenersatz bieten zu können.

Diese Übelstände führten zum Erlass des Reichsgesetzes, betreffend die Verbindlichkeit zum Schadenersatz für die bei dem Betriebe von Eisenbahnen, Bergwerken etc. herbeigeführten Tödtungen und Körperverletzungen, vom 7. Juni 1871 (sogenanntes Haftpflichtgesetz), welches dem Unternehmer für Unfälle, die in seinem Betriebe vorkommen, unter gewissen Voraussetzungen (Nachlässigkeit seiner Betriebsbeamten etc.) eine Schadenersatzpflicht auferlegte, sofern nicht der Unfall durch höhere Gewalt oder durch eigenes Verschulden des Verunglückten verursacht war.

Die langwierige Beweisführung, welche dem Verletzten oblag, und die demselben beim Unterliegen im Prozesse treffende hohe Kostenlast hielten aber manche vom Klagen ab. Wenn hierin auch die Rechtsschutzeinrichtungen verschiedener Berufsvereine, z. B. der Gewerkvereine "Hirsch-Duncker," einige Abhülfe geschaffen hatten, so befriedigte das Haftpflichtgesetz doch nicht die berechtigten Wünsche der Arbeiter, welche dem kapitalkräftigen Unternehmerthume in Streitfällen meist ohnmächtig gegenüber standen. Die Reichsregierung, welche diesen Übelstand einsah, fasste daher den Plan, die Arbeiter von der privatrechtlichen Fürsorge der Arbeitgeber unabhängig zu machen und ihnen die Fürsorge einer öffentlich-rechtlichen Versicherung zuzuwenden. Zu diesem Zwecke legte die Reichsregierung unterm 8. März 1881 den "Entwurf eines Gesetzes, betreffend die Unfallversicherung der Arbeiter" dem Reichstage vor, mit dem die Reihe der socialpolitischen Gesetzentwürfe eröffnet wurde. Der Entwurf wurde mit verschiedenen Abänderungen vom Reichstage angenommen, erhielt jedoch nicht die Zustimmung des Bundesraths. Ein zweiter "Entwurf eines Gesetzes, betreffend die Unfallversicherung der Arbeiter," welcher dem Reichstage unterm 8. Mai 1882 vorgelegt wurde, gelangte nicht zur Verabschiedung, gedieh vielmehr nur bis zur Commissionsberathung. Erst der dritte Entwurf, welchen die Reichsregierung dem Reichstage unterm 6. März 1884 vorlegte, wurde zum Gesetz erhoben.

Dieses erste Unfallversicherungsgesetz vom 6. Juli 1884 betraf hauptsächlich gewerbliche Betriebe und wird deshalb auch "gewerbliches Unfallversicherungsgesetz" genannt. Ihm sind unterworfen:

1. Alle in Bergwerken, Salinen, Aufbereitungsanstalten, Steinbrüchen, Gräbereien (Gruben), auf Werften und Bauhöfen, sowie in Fabriken und Hüttenwerken beschäftigten Arbeiter und Betriebsbeamten, letztere sofern ihr Jahresarbeitsverdienst an Lohn oder Gehalt 2,000 M. nicht übersteigt.
2. Die Arbeiter und Betriebsbeamten, welche in anderen als den vorbezeichneten Betrieben beschäftigt sind, in denen Dampfkessel oder durch elementare Kraft (Wind, Wasser, Dampf, Gas, heisse Luft u.s.w.) bewegte Triebwerke zur Verwendung kommen. Ausgenommen sind hierbei die land- und forstwirthschaftlichen nicht unter Ziffer 1 fallenden Nebenbetriebe, sowie diejenigen Betriebe, für welche nur vorübergehend eine

nicht zur Betriebsanlage gehörende Kraftmaschine benutzt wird.

3. Arbeiter und Betriebsbeamte, welche von einem Gewerbetreibenden, dessen Gewerbebetrieb sich auf die Ausführung von Maurer-, Zimmer-, Dachdecker-, Steinhauer- und Brunnenarbeiten erstreckt, in diesem Betriebe beschäftigt werden, sowie die im Schornsteinfegergewerbe beschäftigten Arbeiter.
4. Arbeiter und Betriebsbeamte in gewerblichen Anlagen, Eisenbahn- und Schiffahrtsbetrieben, welche wesentliche Bestandtheile eines der vorbezeichneten Betriebe sind.

Durch statutarische Bestimmung der Berufsgenossenschaften kann die Versicherungspflicht auf Betriebsbeamte mit einem 2,000 M. übersteigenden Jahresarbeitsverdienst erstreckt werden. Durch Statut kann ferner bestimmt werden, dass und unter welchen Bedingungen Unternehmer der nach Ziffer 1 bis 4 versicherungspflichtigen Betriebe berechtigt sind, sich selbst oder andere nach Ziffer 1 bis 4 nicht versicherungspflichtige Personen zu versichern. Für solche unter Ziffer 1 bis 4 fallende Betriebe, welche mit Unfallgefahr für die darin beschäftigten Personen nicht verknüpft sind, kann durch Beschluss des Bundesraths die Versicherungspflicht ausgeschlossen werden.

Eine Erweiterung erfuhr die Versicherungspflicht durch das Gesetz vom 28. Mai 1885 (das sogenannte Ausdehnungsgesetz). Nach demselben findet das Unfallversicherungsgesetz vom 6. Juli 1884 Anwendung auf

1. den gesammten Betrieb der Post-, Telegraphen- und Eisenbahnverwaltungen, sowie sämmtliche Betriebe der Marine- und Heeresverwaltungen, und zwar einschliesslich der Bauten, welche von diesen Verwaltungen für eigene Rechnung ausgeführt werden;
2. den Baggereibetrieb;
3. den gewerbsmässigen Fuhrwerks-, Binnenschifffahrts-, Flösserei-, Prahm- und Fährbetrieb, sowie den Gewerbebetrieb des Schiffsziehens (Treidelei);
4. den gewerbsmässigen Speditions-, Speicher- und Kellereibetrieb;
5. den Gewerbebetrieb der Güterpacker, Güterlader, Schaffer, Bracker, Wäger, Messer, Schauer und Stauer.

Durch das landwirthschaftliche Unfallversicherungsgesetz vom 5. Mai 1886 wurden der Versicherung unterworfen

alle in land- oder forstwirthschaftlichen Betrieben beschäftigten Arbeiter- und Betriebsbeamten, letztere sofern ihr Jahresarbeitsverdienst an Lohn oder Gehalt 2,000 M. nicht übersteigt; ebenso die Arbeiter und Betriebsbeamten in land- und forstwirthschaftlichen nicht unter das Unfallversicherungsgesetz vom 6 Juli 1884 fallenden Nebenbetrieben.

Der Landesgesetzgebung bleibt überlassen, zu bestimmen, in welchem Umfange und unter welchen Voraussetzungen Unternehmer der vorstehend bezeichneten Betriebe versichert sein sollen. Ebenso kann durch

statutarische Bestimmung die Versicherungspflicht auf Betriebsbeamte mit einem 2,000 M. übersteigenden Jahresarbeitsverdienste und auf Betriebsunternehmer ausgedehnt werden, deren Jahresverdienst 2,000 M. nicht übersteigt. Die Unternehmer der oben bezeichneten Betriebe sind berechtigt, andere nicht versicherungspflichtige in ihrem Betriebe beschäftigte Personen und, sofern ihr Jahresarbeitsverdienst 2,000 M. nicht übersteigt, sich selbst zu versichern. Diese letztere Berechtigung kann durch Statut auf Unternehmer mit einem 2,000 M. übersteigenden Jahresarbeitsverdienste erstreckt werden.

Nach dem Gesetz, betreffend die Unfallversicherung der bei Bauten beschäftigten Personen, vom 11. Juli 1887 werden

> die Arbeiter, welche bei der Ausführung von Bauarbeiten beschäftigt und nicht schon auf Grund der vorstehend behandelten Gesetze vom 6. Juli 1884, 28. Mai 1885 und 5. Mai 1886 gegen Unfall versichert sind, versichert. Dasselbe gilt von den bei derartigen Bauarbeiten beschäftigten Betriebsbeamten, sofern ihr Jahresarbeitsverdienst an Lohn oder Gehalt 2,000 M. nicht übersteigt. Durch statutarische Bestimmung kann die Versicherungspflicht auf Betriebsbeamte mit einem 2,000 M. übersteigenden Jahresarbeitsverdienste und auf Gewerbetreibende ausgedehnt werden, welche nicht regelmässig wenigstens einen Lohnarbeiter beschäftigen.

Unternehmer von Bauarbeiten sind berechtigt, andere, als die vorstehenden, bei der Bauausführung beschäftigte Personen, welche also an sich nicht versichert sind, und, sofern ihr Jahresarbeitsverdienst 2,000 M. nicht übersteigt, sich auch selbst zu versichern. Diese letztere Berechtigung kann durch Statut auf Unternehmer mit einem 2,000 M, übersteigenden Jahresarbeitsverdienste und auf Gewerbetreibende ausgedehnt werden, welche nicht regelmässig wenigstens einen Lohnarbeiter beschäftigen.

Das Gesetz, betreffend die Unfallversicherung der Seeleute und anderer bei der Seeschiffahrt betheiligter Personen, vom 13. Juli 1887 unterwirft der Versicherungspflicht alle Personen, welche

1. auf deutschen Seefahrzeugen als Schiffer, Personen der Schiffsmannschaft, Maschinisten, Aufwärter oder in anderer Eigenschaft zur Schiffsbesatzung gehören (Seeleute), Schiffer jedoch nur, sofern sie Lohn oder Gehalt beziehen;
2. in inländischen Betrieben schwimmender Docks und ähnlicher Einrichtungen, sowie in inländischen Betrieben für die Ausübung des Lootsendienstes, für die Rettung oder Bergung von Personen oder Sachen bei Schiffbrüchen, für die Bewachung, Beleuchtung oder Instandhaltung der dem Seeverkehr dienenden Gewässer beschäftigt sind.

Seeleute unterliegen den Bestimmungen dieses Gesetzes nicht, wenn sie zur Besatzung von Fischerfahrzeugen, oder wenn sie zur Besatzung solcher Seefahrzeuge gehören, die nicht mehr als fünfzig Kubikmeter Brutto-Raumgehalt haben und dabei weder Zubehör eines grösseren Fahrzeuges, noch auf Fortbewegung durch Dampf oder andere Maschinenkräfte eingerichtet sind.

Die Versicherung erfolgt unter Garantie des Reichs auf Gegenseitigkeit durch die Unternehmer welche zu diesem Zwecke in

Berufsgenossenschaften vereinigt werden. Die Berufsgenossenschaften sind für bestimmte Bezirke zu bilden und umfassen innerhalb derselben alle Betriebe derjenigen Industriezweige, für welche sie errichtet sind. Betriebe welche wesentliche Bestandtheile verschiedenartiger Industriezweige umfassen, sind derjenigen Berufsgenossenschaft zuzutheilen, welcher der Hauptbetrieb angehört. Die Berufsgenossenschaften können unter ihrem Namen Rechte erwerben und Verbindlichkeiten eingehen, vor Gericht klagen und verklagt werden. Für die Verbindlichkeiten der Berufsgenossenschaft haftet den Gläubigern derselben nur das Genossenschaftsvermögen. Berufsgenossenschaften, welche zur Erfüllung der ihnen durch das Gesetz auferlegten Verpflichtungen leistungsunfähig werden, können auf Antrag des Reichs-Versicherungsamts von dem Bundesrath aufgelöst werden. Diejenigen Industriezweige, welche die aufgelöste Genossenschaft gebildet haben, sind anderen Berufsgenossenschaften nach deren Anhörung zuzutheilen. Mit der Auflösung der Genossenschaft gehen deren Rechtsansprüche und Verpflichtungen auf das Reich bezw. in einzelnen Fällen auf den Bundesstaat über, für dessen Gebiet die aufgelöste Berufsgenossenschaft gegründet war.

Ein Unterschied besteht in der Verwaltung der gewerblichen und der landwirthschaftlichen Berufsgenossenschaften insofern, als die gewerblichen Berufsgenossenschaften sich selbst verwalten, während die Verwaltung der landwirthschaftlichen Berufsgenossenschaften fast durchweg den kommunalen Selbstverwaltungsbehörden übertragen ist.

Gewerbliche Berufsgenossenschaften giebt es jetzt 65, welche sich auf die einzelnen Industriegruppen, wie folgt, vertheilen: Baugewerke 14, Textil- sowie Eisen- und Stahlindustrie je 8, Nahrungs- und Genussmittelindustrie 7, Holzindustrie, Landtransport sowie Wassertransport je 4, Industrie der Erden (Glas-, Töpferei-, Ziegelei- Berufsgenossenschaft) 3, Papier-, (Edel- und Unedel-) Metall- sowie Montanindustrie je 2, Feinmechanik, Chemie, Gas- und Wasserwerke, Buchdruckerei, Leder-, Bekleidungs- sowie Musikinstrumentenindustrie je 1.

Landwirthschaftliche Berufsgenossenschaften giebt es 48.

Bei den Betrieben des Reichs, des Staates sowie bei den durch Kommunalverbände ausgeführten Bauarbeiten erfolgt die Versicherung durch das Reich, den Staat oder durch die betreffenden Kommunalverbände, welche zu diesem Zwecke Ausführungsbehörden gebildet haben. Gegenwärtig bestehen 144 Reichs- und staatliche sowie 249 kommunale Ausführungsbehörden.

Für die Regie- (Eigen-) Bauten ist innerhalb jeder Baugewerksberufsgenossenschaft eine Versicherungsanstalt errichtet, welche von der betreffenden Berufsgenossenschaft mit verwaltet wird. Den örtlichen Verhältnissen tragen die Berufsgenossenschaften event. durch Einrichtung von Sectionen für den Bezirk grösserer Kommunalverbände (Provinzen, Kreise) sowie durch die Bestellung von örtlichen Bevollmächtigten (Vertrauensmännern) Rechnung.

Nach der Statistik von 1895 fallen unter die Unfallversicherung 5,248,709 Betriebe mit 18,389,468 versicherten Personen. Das Vermögen der Berufsgenossenschaften und Versicherungsanstalten betrug 143,396,459 M.

Zum Unterschiede von der Krankenversicherung und der Invaliditäts- und Alters-Versicherung sind bei der Unfallversicherung nicht die versicherten Arbeiter selbst, sondern die Unternehmer der ver-

sicherungspflichtigen Betriebe Mitglieder der Berufsgenossenschaften und zwar beginnt die Mitgliedschaft ebenso, wie bei der Krankenversicherung, nicht erst in Folge der Anmeldung, sondern ex lege mit dem Zeitpunkte der Eröffnung der Betriebe bezw. des Beginns der Versicherungspflicht derselben. Entsprechend dieser Organisation werden auch nicht die versicherten Arbeiter sondern die Betriebe angemeldet, wobei nur die zur Zeit in dem Betriebe beschäftigten versicherungspflichtigen Personen zahlenmässig angegeben werden. Die Namen der versicherten Personen erfahren die Berufsgenossenschaften nur aus den alljährlich für das verflossene Geschäftsjahr von den Unternehmern einzureichenden Lohnnachweisungen.

Über die angemeldeten Betriebe wird ein besonderes Genossenschaftskataster geführt.

Gegenstand der Versicherung ist der Ersatz des Schadens, welcher durch Körperverletzung oder Tödtung entsteht. Der Schadenersatz soll im Falle der *Verletzung* bestehen:

1. In den Kosten des Heilverfahrens, welche vom Beginn der 14. Woche nach Eintritt des Unfalls an (so lange hat die Krankenkasse mindestens zu sorgen) entstehen;
2. in einer dem Verletzten vom Beginn der 14. Woche nach Eintritt des Unfalls an für die Dauer der Erwerbsunfähigkeit zu gewährenden Rente, welche nach dem zuletzt verdienten Lohne berechnet wird. Die Rente beträgt:
   (*a*) im Falle völliger Erwerbsunfähigkeit für die Dauer derselben $66\frac{2}{3}$ Prozent des Arbeitsverdienstes,
   (*b*) im Falle theilweiser Erwerbsunfähigkeit für die Dauer derselben einen Bruchtheil der Rente unter *a*, welcher nach dem Maasse der verbliebenen Erwerbsfähigkeit zu bemessen ist.

Die Berufsgenossenschaften sind befugt, der Krankenkasse, welcher der Verletzte angehört, gegen Erstattung der ihr dadurch erwachsenden Kosten die Fürsorge für den Verletzten über den Beginn der 14. Woche hinaus bis zur Beendigung des Heilverfahrens zu übertragen. Denjenigen Versicherten, welche nicht nach den Bestimmungen des Krankenversicherungsgesetzes versichert sind, hat der Betriebsunternehmer die nach diesem letzteren Gesetze vorgeschriebenen Mindestleistungen für die ersten 13 Wochen aus eigenen Mitteln zu leisten. Vom Beginn der 5. Woche nach Eintritt des Unfalls bis zum Ablauf der 13. Woche ist das Krankengeld auf mindestens $\frac{2}{3}$ des bei der Berechnung desselben zu Grunde gelegten Arbeitslohnes zu bemessen. Die Differenz zwischen diesen zwei Dritteln und dem gesetzlich oder statutengemäss zu gewährenden niedrigeren Krankengelde ist der betheiligten Krankenkasse von dem Unternehmer desjenigen Betriebes zu erstatten, in welchem der Unfall sich ereignet hat.

Im Falle der *Tödtung* ist als Schadenersatz ausserdem zu leisten

1. als Ersatz der Beerdigungskosten das Zwanzigfache des täglichen Arbeitsverdienstes, jedoch mindestens 30 M.;
2. eine den Hinterbliebenen des Getödteten vom Todestage an zu gewährende Rente. Dieselbe beträgt:

(*a*) Für die Wittwe des Getödteten bis zu deren Tode oder Wiederverheirathung 20 Prozent, für jedes hinterbliebene vaterlose Kind bis zu dessen zurückgelegtem 15. Lebensjahre 15 Prozent und, wenn das Kind auch mutterlos ist oder wird, 20 Prozent des Arbeitsverdienstes.

Die Renten der Wittwe und der Kinder dürfen zusammen 60 Prozent des Arbeitsverdienstes nicht übersteigen; ergiebt sich ein höherer Betrag, so werden die einzelnen Renten in gleichem Verhältnisse gekürzt.

Im Falle der Wiederverheirathung erhält die Wittwe den dreifachen Betrag ihrer Jahresrente als Abfindung.

Der Anspruch der Wittwe ist ausgeschlossen, wenn die Ehe erst nach dem Unfalle geschlossen worden ist;

(*b*) Für Aszendenten des Verstorbenen, wenn dieser ihr einziger Ernährer war, für die Zeit bis zu ihrem Tode oder bis zum Wegfall der Bedürftigkeit 20 Prozent des Arbeitsverdienstes.

Wenn mehrere der unter *b* benannten Berechtigten vorhanden sind, so wird die Rente den Eltern vor den Grosseltern gewährt.

Wenn die unter *b* bezeichneten mit den unter *a* bezeichneten Berechtigten konkurriren, so haben die ersteren einen Anspruch nur, soweit für die letzteren der Höchstbetrag der Rente nicht in Anspruch genommen wird.

Die Hinterbliebenen eines Ausländers, welche zur Zeit des Unfalls nicht im Inlande wohnten, haben keinen Anspruch auf die Rente. Ausländer, welche dauernd das Reichsgebiet verlassen, kann die Berufsgenossenschaft durch eine Kapitalzahlung für ihren Entschädigungsanspruch abfinden.

An Stelle der im Falle *Verletzung* zu erstattenden Kosten des Heilverfahrens und der Rente kann bis zum beendigten Heilverfahren freie Kur und Verpflegung in einem Krankenhause gewährt werden. Für die Zeit der Verpflegung des Verunglückten in dem Krankenhause steht den vorbezeichneten Angehörigen desselben die Hinterbliebenen-Rente insoweit zu, als sie auf dieselbe im Falle des Todes des Verletzten einen Anspruch haben würden.

Ausdrücklich hervorzuheben ist hier noch, dass die Unfallversicherung nur bei *Betriebs*unfällen eintritt, d. i. also bei Unfällen, welche mit den eigenthümlichen Gefahren des Betriebes in ursächlichem Zusammenhange stehen.

Die Durchschnittsergebnisse der Leistungen gehen aus nachstehender Aufstellung hervor:

Rechnungsjahr	Auf 1 Versicherten kommen Mark					Auf 1 Unfall kommen Mark	Auf 1,000 Versicherte kommen Entschädigte				Auf 100 M. Entschädigung kommen			
	Beiträge der		Kosten der		Vermögen		Verletzte Personen	Hinterbliebene			Renten für		Kosten für	
	Arbeitgeber	Arbeitnehmer	Entschädigung	Verwaltung				Wittwen	Waisen	Eltern	Verletzte	Hinterbliebene	Heilverfahren	Beerdigung
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Im Jahre 1890	2·98	—	1·40	0·40	5·52	200·00	6·3	1·0	1·9	0·1	68·66	21·35	8·61	1·38
Im 50 Jahre	6·86	—	6·40	0·40	13·72	200·00	21·7	8·3	5·0	0·3	67·44	30·20	2·04	0·32

Die allgemeinen Verwaltungsunkosten betragen in der Unfallversicherung rund 8 % der Gesammteinnahme.

Von den in einem versicherten Betriebe vorkommenden Unfällen, durch welche eine in demselben beschäftigte Person getödtet wird oder eine Körperverletzung erleidet, welche eine Arbeitsunfähigkeit von mehr als 3 Tagen oder den Tod zur Folge hat, ist von dem Betriebsunternehmer bei der Ortspolizeibehörde (bei Unfällen auf der See bei einem Seemannsamte) schriftliche Anzeige (nach Formular) zu machen. Diese haben die gemeldeten Unfälle unter Benachrichtigung und eventl. Theilnahme des Betriebsunternehmers, des Bevollmächtigten der Krankenkasse, des Verletzten sowie unter eventl. Hinzuziehung von Zeugen und Sachverständigen zu untersuchen und hierbei besonders festzustellen:

1. die Veranlassung und Art des Unfalls,
2. die getödteten oder verletzten Personen,
3. die Art der vorgekommenen Verletzungen,
4. den Verbleib der verletzten Personen,
5. die Hinterbliebenen der durch den Unfall getödteten Personen, welche nach dem Gesetz einen Entschädigungsanspruch erheben können.

Die Kosten dieser Feststellungen trägt die zuständige Berufsgenossenschaft.

Demnächst werden die Entschädigungen für die durch Unfall verletzten Versicherten und für die Hinterbliebenen der durch Unfall getödteten Versicherten durch die Berufsgenossenschaft bezw. die zuständige Sektion derselben festgestellt. Diese Feststellung hat *ohne* Antrag der Berechtigten von Amtswegen zu erfolgen. Vor der Feststellung der Entschädigung ist den Berechtigten durch Mittheilung der Unterlagen, auf Grund deren dieselbe zu bemessen ist, Gelegenheit zu geben, sich binnen einer Frist von einer Woche zu äussern. Entschädigungsberechtigte, für welche die Entschädigung nicht von Amtswegen festgestellt ist, haben ihren Entschädigungsanspruch bei Vermeidung des Ausschlusses vor Ablauf von 2 Jahren nach dem Eintritte des Unfalls anzumelden.

Bei Feststellung des Grades der zum Bezuge einer Rente erforderlichen Erwerbsunfähigkeit ist zu beachten, dass dem Verletzten der Schaden, d. i. der wirthschaftliche Nachtheil, der ihm durch die Verletzung erwachsen ist, ersetzt werden soll. Zu der Erwerbsunfähigkeit im Sinne der Unfallversicherung gehört daher eine gewisse Beeinträchtigung des körperlichen oder geistigen Zustandes, also ein Defect der körperlichen oder geistigen Fähigkeiten, wodurch der Versicherte behindert oder es ihm erschwert ist, auf dem Arbeits- und Wirthschaftsmarkte quantitativ oder qualitativ das Gleiche, wie bisher, zu leisten. Diese Verminderung der Erwerbsfähigkeit ist nicht identisch mit der Erwerbsunfähigkeit in der Krankenversicherung. Während bei dieser in Folge des vorübergehenden Characters der Krankheit schon die Arbeitsunfähigkeit in dem speciellen Berufe, ja sogar in dem speciellen Betriebe zum Empfang des Krankengeldes genügt, muss sich bei der mehr oder minder andauernden Unfall-, ebenso wie auch bei der Invalidenrente, die Erwerbsunfähigkeit auf das ganze wirthschaftliche Gebiet erstrecken, welches dem Versicherten durch seine Kräfte und Fähigkeiten, sowie

durch seine Stellung im socialen Leben und seine bisherige Lebensweise erschlossen ist.

Gegen die Entscheidungen, welche den Entschädigungsanspruch ablehnen oder die Entschädigung fesstellen, steht den Betheiligten Berufung an das Schiedsgericht und gegen dessen Entscheidungen Rekurs an das Reichs-Versicherungsamt offen. Das Verfahren bei beiden Rechtsmittelinstanzen ist kostenfrei.

Wird eine Entschädigung festgestellt, so erhalten die Berechtigten einen Berechtigungsausweis. Die auf Grund des Unfallversicherungsgesetzes festgestellten Entschädigungen sind im Allgemeinen unpfändbar. Tritt in den Verhältnissen, welche für die Fesstellung der Entschädigung massgebend gewesen sind, eine wesentliche Veränderung ein, so kann eine anderweitige Fesstellung derselben auf Antrag oder von Amtswegen erfolgen.

Die Auszahlung der Entschädigungen erfolgt durch die für den Wohnort der Berechtigten zuständigen Postanstalten. Diese liquidiren die von ihnen verauslagten Beträge durch Vermittelung der Zentralpostbehörden bei den verpflichteten Berufsgenossenschaften zur Erstattung.

Die Einziehung der Kostenbeiträge von den verpflichteten Unternehmern erfolgt verschieden. Im Allgemeinen ist das *Umlageverfahren* vorherrschend. Dies besteht besonders bei den gewerblichen, Hochbau- und landwirtschaftlichen Berufsgenossenschaften sowie bei der Seeberufsgenossenschaft. Nach diesem Verfahren werden die von den Zentralpostbehörden zur Erstattung liquidirten Beträge von den Genossenschaftsvorständen gleichzeitig mit den Verwaltungsunkosten und den vorgeschriebenen Rücklagen zum Reservefonds nach dem festgestellten Vertheilungsmassstab auf die Genossenschaftsmitglieder umgelegt und von denselben eingezogen. Der Vertheilungsmassstab wird gewonnen durch die von den Genossenschaftsmitgliedern am Schlusse des Rechnungsjahres dem Genossenschaftsvorstande einzureichenden Lohnnachweisungen, welche enthalten müssen

1. die während des abgelaufenen Rechnungsjahres im Betriebe beschäftigten versicherten Personen und die von denselben verdienten Löhne und Gehälter;
2. eine Berechnung der bei der Umlegung der Beiträge in Anrechnung zu bringenden Beträge der Löhne und Gehälter;
3. die Gefahrenklasse, in welche der Betrieb eingeschätzt worden ist.

Die Gefahrenklassen sind durch die Genossenschaftsversammlung für die zur Genossenschaft gehörigen Betriebe je nach dem Grade der mit denselben nach der geführten Unfallstatistik verbundenen Unfallgefahr zu bilden, wobei zugleich über die Höhe der in jeder Gefahrenklasse zu leistenden Beiträge (Gefahrentarit) Bestimmungen zu treffen sind. Die Aufstellung und Abänderung des Gefahrentarifs bedarf der Genehmigung des Reichsversicherungsamts. Die Veranlagung der Betriebe zu den einzelnen Gefahrenklassen liegt den Organen der Genossenschaft ob. Gegen die Veranlagung steht dem Betriebsunternehmer die Beschwerde an das Reichsversicherungsamt zu. Der Gefahrentarif ist von 5 zu 5 Jahren einer Revision zu unterziehen.

Die Genossenschaftsmitglieder können gegen die Fesstellung ihrer Beiträge Widerspruch bei dem Genossenschaftsvorstande und gegen

dessen Entscheidung Beschwerde bei dem Reichsversicherungsamte erheben. Rückständige Beiträge werden wie Gemeindeabgaben erhoben.

Bei der Tiefbauberufsgenossenschaft und bei den für Regiebauten errichteten Versicherungsanstalten der Hochbauberufsgenossenschaften ist wegen des schwankenden Characters der bei denselben versicherten Betriebe das *Kapitaldeckungssystem* eingeführt. Dieses System besteht darin, dass für jedes Jahr der Kapitalwerth der in dem betreffenden Rechnungsjahr entstandenen dauernden Renten aufzubringen ist. Der Kapitalwerth, für dessen Berechnung das Reichsversicherungsamt bestimmte Grundsätze aufgestellt und in seinen *Amtlichen Nachrichten* (Jahrgang 1894 No. 3) veröffentlicht hat, entspricht dem Betrage, welcher mit Zins und Zinseszins voraussichtlich genügt, um die Last der dauernden Renten während ihrer Bezugszeit aufzubringen. Da jedoch von dem berechneten Kapitalwerthe der neu festgestellten Renten die im voraufgegangenen Rechnungsjahre durch Tod heimgefallenen Kapitalwerthe abzuziehen sind, so ist nach der erwähnten Anweisung des Reichsversicherungsamts der Jahresbedarf an Deckungskapital wie folgt zu berechnen: Alljährlich wird

(*a*) das Gesammtkapital (Solldeckungskapital) ermittelt, welches rechnerisch erforderlich ist, um die künftigen Rentenverbindlichkeiten aus allen Unfällen zu befriedigen, für welche am Schluss des Rechnungsjahres Renten zu zahlen waren;

(*b*) der Bestand des aus den Vorjahren vorhandenen Deckungskapitals (Istdeckungskapital), welches nach Abzug der in dem Rechnungsjahre gezahlten Rentenbeträge am Schluss des Rechnungsjahres verbleibt, festgestellt.

Der aus der Gegenüberstellung der beiden Summen sich ergebende Mehrbetrag des Solldeckungskapitals bildet das für das Rechnungsjahr erforderliche, in die Jahresrechnung als solches einzustellende Deckungskapital. Neben dem Deckungskapital sind noch die Verwaltungsunkosten, die einmaligen Entschädigungsleistungen und die Rentenzahlungen vorübergehender Art in die Jahresrechnung einzustellen. Die Ausschreibung der hiernach zu erhebenden Beiträge erfolgt demnächst nach Massgabe der in den Betrieben der Mitglieder von den Versicherten verdienten Löhne und Gehälter etc., sowie des statutenmässigen Gefahrentarifs. Auf die Beiträge sind von den Genossenschaftsmitgliedern vierteljährliche Vorschüsse zu leisten.

Umlageverfahren und *Kapitaldeckungsverfahren* haben beide ihre Vortheile. Im Allgemeinen ist es zur Sicherheit, zur Stabilität und zur gedeihlichen Entwickelung eines jeden Versicherungsunternehmens —also auch der öffentlich-rechtlichen Arbeiterversicherung—nothwendig, dass sich das Unternehmen auf versicherungstechnischen Grundlagen aufbaut (wie dies bei dem Kapitaldeckungsverfahren der Fall ist), denn nur diese gewähren einem etwas Greifbares, etwas Konkretes. Die etatsmässige oder kaufmännische Berechnung der voraussichtlichen Aktiven und Passiven genügt bei der Versicherung, wo es sich nicht nur um die gegenwärtige, sondern auch um die zukünftige Leistungsfähigkeit handelt, nicht. So könnte es z. B. bei den mit dem Umlageverfahren arbeitenden deutschen Berufsgenossenschaften eintreten, dass sie im Falle eines unglücklichen Feldzuges oder einer sonstigen finanziellen Depression an die zahlungsfähigen Mit-

glieder hohe und schwer zu erfüllende Anforderungen stellen müssen, wenn sie nicht in Zahlungsschwierigkeiten bei Versorgung der Verunglückten gerathen wollen. Selbst der hypothetische Wahrscheinlichkeitskoëffizient bietet in der Hand eines vorsichtigen und erfahrenen Versicherungstechnikers immer noch sichereres Material, als die sich lediglich auf die Gegenwart erstreckenden etatsmässigen oder kaufmännischen Aufstellungen. In Übereinstimmung mit dieser Ansicht hatte denn auch die Reichsregierung für die in dem ersten Entwurfe (vorgelegt unterm 8. März 1881) geplante Art der Unfallversicherung das dem Kapitaldeckungsverfahren sehr nahe verwandte *Prämiensystem* vorgesehen.

Trotzdem möchte ich im vorliegenden Falle das Umlageverfahren nicht ohne Weiteres verwerfen. Wie schon auf dem "Internationalen Kongresse für Arbeiterunfälle und sociale Versicherungen," welcher vom 26. bis zum 31. Juli 1897 in Brüssel tagte, von mehreren Rednern ausgeführt wurde, müssen nämlich bei einer so bedeutsamen öffentlichen Einrichtung, wie es die deutsche Arbeiterversicherung ist, neben den versicherungstechnischen auch in hervorragendem Maasse volkswirthschaftliche Momente berücksichtigt werden; und von diesem Standpunkte aus betrachtet, liegt es allerdings im Interesse des Handels, der Landwirthschaft und der Industrie, nicht noch grössere Kapitalsmengen dem Verkehr zu entziehen, als es schon jetzt durch die deutsche Arbeiterversicherung geschieht. Eine derartige grosse Kapitalsentziehung wirkt zweifach bedenklich: einerseits schwächt sie die Leistungsfähigkeit des Geschäftslebens und andererseits wirken die grossen dem Verkehr entzogenen Kapitalsmengen, welche in Hypotheken, sicheren Effecten etc. untergebracht werden sollen, drückend auf den Zinsfuss. Übrigens bieten die Berufsgenossenschaften auch eine gewisse Sicherheit durch die Reichsgarantie, und endlich haben dieselben auch zur Sicherung der Erfüllung ihrer Verbindlichkeiten einen *Reservefonds* anzusammeln. An Zuschlägen zur Bildung desselben sind bei der

ersten	Umlage	300	Prozent.
zweiten	„	200	„
dritten	„	150	„
vierten	„	100	„
fünften	„	80	„
sechsten	„	60	„
siebenten	„	50	„
achten	„	40	„
neunten	„	30	„
zehnten	„	20	„
elften	„	10	„

als Zuschlag zu den Entschädigungsbeträgen zu erheben. Nach Ablauf der ersten 11 Jahre sind die Zinsen des Reservefonds dem letzteren solange weiter zuzuschlagen, bis dieser den doppelten Jahresbedarf erreicht hat. Ist das letztere der Fall, so können die Zinsen insoweit, als der Bestand des Reservefonds den laufenden doppelten Jahresbedarf übersteigt, zur Deckung der Genossenschaftslasten verwendet werden. Als weitere Sicherung können sich die Berufsgenossenschaften zur gemeinsamen Tragung des Risikos mit Genehmigung des Reichs-Versicherungsamts unter einander verbinden.

Die Aufsicht über die Beobachtung der gesetzlichen und statutarischen Vorschriften seitens der Genossenschaften führt das Reichs-Versicherungsamt, unbeschadet der dem Reichskanzler bezw. seinem ressortmässigen Stellvertreter, dem Staatssekretär des Innern, nach der Reichsverfassung bezw. dem Reichsgesetze, betreffend die Stellvertretung des Reichskanzlers, vom 17. März 1878 der Volksvertretung gegenüber obliegenden Verantwortlichkeit für die von den Reichsbehörden ausgehenden Maassnahmen. Die Entscheidungen des Reichs-Versicherungsamts sind endgiltig. In Bundesstaaten, wo Landes-Versicherungsämter errichtet sind, übernehmen diese einen Theil der Aufsichtsbefugnisse des Reichs-Versicherungsamts.

Die Verpflichtung von Gemeinden oder Armenverbänden zur Unterstützung Hülfsbedürftiger wird durch dieses Gesetz nicht berührt.

Die Haftpflicht des Arbeitgebers ist fast dieselbe geblieben, wie unter der ausschliesslichen Herrschaft des Haftpflichtgesetzes vom 7. Juni 1871, denn die Verpflichtungen aus diesem sind zum grossen Theile in Kraft geblieben, nur dass dem Arbeitgeber statt des wenig geschäftstüchtigen Arbeiters jetzt in den meisten Fällen die sehr geschäftstüchtige Berufsgenossenschaft gegenübersteht. Das Unfallversicherungsgesetz vom 6. Juli 1884 enthält darüber folgende Bestimmungen.

"§ 95. Die nach Maassgabe dieses Gesetzes versicherten Personen " und deren Hinterbliebene können einen Anspruch auf Ersatz des in " Folge eines Unfalls erlittenen Schadens nur gegen diejenigen Betriebs- " unternehmer, Bevollmächtigten oder Repräsentanten, Betriebs- oder " Arbeiteraufseher geltend machen, gegen welche durch strafgerichtliches " Urtheil festgestellt worden ist, dass sie den Unfall vorsätzlich herbeige- " führt haben.

" In diesem Falle beschränkt sich der Anspruch auf den Betrag, um " welchen die den Berechtigten nach den bestehenden gesetzlichen " Vorschriften gebührende Entschädigung diejenige übersteigt, auf " welche sie nach diesem Gesetze Anspruch haben.

" § 96. Diejenigen Betriebsunternehmer, Bevollmächtigten oder " Repräsentanten, Betriebs- oder Arbeiteraufseher, gegen welche durch " strafgerichtliches Urtheil festgestellt worden ist, dass sie den Unfall " vorsätzlich oder durch Fahrlässigkeit mit Ausserachtlassung derjenigen " Aufmerksamkeit, zu der sie vermöge ihres Amtes, Berufes oder Gewerbes " besonders verpflichtet sind, herbeigeführt haben, haften für alle Auf- " wendungen, welche in Folge des Unfalls auf Grund dieses Gesetzes oder " des Gesetzes, betreffend die Krankenversicherung der Arbeiter, vom 15. " Juni 1883 von den Genossenschaften oder Krankenkassen gemacht " worden sind.

" Als Ersatz für die Rente kann in diesen Fällen deren Kapital- " werth gefordert werden.

"§ 97. Die in den §§ 95 und 96 bezeichneten Ansprüche können, auch " ohne dass die daselbst vorgesehene Fesstellung durch strafgerichtliches " Urtheil stattgefunden hat, geltend gemacht werden, falls diese Fest- " stellung wegen des Todes oder der Abwesenheit des Betreffenden oder " aus einem anderen in der Person desselben liegenden Grunde nicht " erfolgen kann."

Während § 95 den Verletzten und den Hinterbliebenen der

Getödteten ein Forderungsrecht giebt, konstruirt § 99 ein solches Recht für die Berufsgenossenschaften und Krankenkassen. Jedoch haben die Berufsgenossenschaften von ihrem Rechte nur sehr mässigen Gebrauch gemacht, manche überhaupt nicht. Nach einer von dem "Haftpflicht-Schutzverband deutscher Industrieller," unternommenen statistischen Aufnahme, an der sich 30 Berufsgenossenschaften mit 2,532,609 versicherten Personen betheiligten, hatten in den Jahren 1889–1894 von ihrem Regressrechte gar keinen Gebrauch gemacht 19 Berufsgenossenschaften; die übrigen 11 Berufsgenossenschaften hatten in dieser Zeit 145 Regressansprüche aus §§ 96, 97 und 59 Regressansprüche aus § 98 Unfallversicherungs-Gesetzes (Haftung Dritter), zusammen 204 Regressansprüche, allerdings mit zum Theil sehr erheblichen Beträgen erhoben. Dieser mässige Gebrauch ihres Regressrechtes seitens der Berufsgenossenschaften ist aber auch sehr berechtigt, denn die Arbeiterversicherung sollte die sociale Unzufriedenheit gerade möglichst beseitigen und nicht noch mehr anfachen.

Ältere Versicherungsverträge, welche von den Betriebsunternehmern pp. gegen die Folgen der unter die Unfallversicherungs-Gesetze fallenden Betriebsunfälle mit Privat-Versicherungsgesellschaften abgeschlossen worden waren, gingen nach dem Inkrafttreten der gesetzlichen Unfallversicherung auf Antrag der Versicherungsnehmer mit allen Rechten und Pflichten auf die zuständige Berufsgenossenschaft über. Da die meisten Versicherungen gleichzeitig

1. gegen die Folgen der gesetzlichen Haftpflicht,

2. gegen die Folgen körperlicher Unfälle im Betriebe überhaupt (sogenannte kombinirte Kollectivversicherung) abgeschlossen waren, kam es in der Praxis in Frage, ob und inwieweit diese Verträge theilbar waren, denn die Berufsgenossenschaften übernahmen die Verträge nur, soweit sie auf Betriebsunfälle Bezug hatten (also die zu 2 genannten). Diese Theilbarkeit wurde von den höchsten Gerichtshöfen anerkannt, besonders auch aus dem Grunde, weil die vorbezeichneten Verträge bereits meist aus zwei getrennten Theilen bestanden. Wenn die Prämie für beide Versicherungen in der Police auch einheitlich festgesetzt war, so enthielten doch die Tarife keine einheitliche Prämie, sondern für jede einzelne von beiden Versicherungen getrennte Fesstellungen. Dabei wurde stets in der Weise verfahren, dass die Prämie für die Versicherung zu 2 fest nach dem Tarif vereinbart wurde und je nach der Höhe dieser Versicherung nur bezüglich der Prämie für die Versicherung zu 1 Nachlässe zugestanden wurden. Die Berufsgenossenschaft konnte also die Versicherung zu 2 ohne Schwierigkeiten mit der vollen für diese Versicherungsart festgesetzten Prämie übernehmen, während der Betriebsunternehmer die Versicherung zu 1 beibehielt; in Folge der Trennung des bisherigen Versicherungsnehmers in zwei solche konnte die Haftpflichtprämie (zu 1) natürlich nun voll, d. i. ohne Nachlass, von dem Betriebsunternehmer gefordert werden.

Die öffentlichen Behörden müssen den Berufsgenossenschaften und diese sich unter einander auf Ersuchen Rechtshülfe leisten.

Alle zur Begründung und Abwickelung der Rechtsverhältnisse zwischen den Berufsgenossenschaften und Versicherten erforderlichen schiedsgerichtlichen und aussergerichtlichen Verhandlungen und Urkunden sind gebühren- und stempelfrei.

Zuwiderhandlungen gegen die Vorschriften der Unfallversicherungs-

gesetze sind unter Strafe gestellt. Die Strafen werden in Form von Ordnungstrafen seitens der Genossenschaftsvorstände verhängt.

Ausser den bereits genannten Gesetzen ist noch das Gesetz, betreffend die Fürsorge für Beamte und Personen des Soldatenstandes in Folge von Betriebsunfällen, vom 15. März 1886 (sogenanntes Beamten-Unfall-Fürsorge-Gesetz) zu erwähnen. Dasselbe ist weniger ein Unfallversicherungs-Gesetz als ein Pensionsgesetz, indem es lediglich den bestimmten im Gesetz näher bezeichneten Kategorien von Beamten oder Militärpersonen aus Billigkeitsgründen bei Betriebsunfällen eine höhere Pension zuwenden will.

Wie die ganze deutsche Arbeiterversicherung von sanitärem Nutzen gewesen ist, so hat auch die Unfallversicherung dazu beigetragen, die Sicherheit der Arbeiter vor den Gefahren der Betriebe zu erhöhen. Insbesondere haben die Berufsgenossenschaften durch ihre Unfallverhütungsvorschriften Vorzügliches geleistet, wie allseitig—auch von den staatlichen Gewerbe- und Medicinalbeamten—anerkannt wird. Die Unfallverhütungsvorschriften der Berufsgenossenschaften bilden eine wirksame und werthvolle Unterstützung der diesbezüglichen behördlichen Maassnahmen und ebenso hat sich das einmüthige Zusammengehen der seitens der Berufsgenossenschaften mit der Beaufsichtigung der Betriebe ihrer Mitglieder betrauten " Beauftragten " mit den staatlichen Aufsichtsorganen als sehr vortheilhaft erwiesen. Die einzelnen Berufsgenossenschaften haben daher auf Grund der gesetzlichen Befugniss Unfallverhütungsvorschriften für ihre Mitglieder erlassen, deren Durchführung dadurch erleichtert wird, dass die Berufsgenossenschaften befugt sind, einerseits säumige Arbeit*geber* mit Einschätzung in eine höhere Gefahrenklasse bezw. mit Zuschlägen zu den Beiträgen zu bestrafen und andererseits nachlässige Arbeit*nehmer* mit Geldstrafen zu belegen. Besonders wichtig und interessant sind die von den Berufsgenossenschaften zum Schutze der Arbeiter bei Fabrikbränden und zur Verhütung von solchen erlassenen Vorschriften, von denen ein Auszug in den " Jahresberichten der Königlich Preussischen Gewerberäthe " etc. Jahrgang 1890 enthalten ist. Endlich sind auf Anregung der Berufsgenossenschaften in neuerer Zeit Normal-Unfallverhütungsvorschriften und zwar

(*a*) für land- und forstwirthschaftliche Betriebe (im Jahre 1895),
(*b*) für gleichartige Gefahren in den unter die Unfallversicherungs-Gesetze fallenden gewerblichen Betrieben (im Jahre 1896)

veröffentlicht worden, welche den Zweck haben sollen, eine gewisse Gleichmässigkeit auf diesem Gebiete herbeizuführen. Die Beauftragten der Berufsgenossenschaften sind bezüglich etwaiger Betriebsgeheimnisse, welche bei Gelegenheit der Revision der Betriebe zu ihrer Kenntniss gelangen, zur Verschwiegenheit verpflichtet. Zuwiderhandlungen gegen dieses Gebot werden streng bestraft.

Es kann nicht bestritten werden, dass durch diese Unfallverhütungsvorschriften, ebenso wie durch die auf die Einwirkung der Arbeiterversicherung und ihrer Organe zurückzuführende neuerliche Verbesserung der von den Reichs- und Staatsbehörden erlassenen gewerbehygienischen Vorschriften eine entschiedene Abschwächung der Unfallgefährlichkeit der Industrie, Landwirthschaft etc. erreicht worden ist, wenn auch selbstverständlich immer noch genug zu thun, auf diesem Gebiete übrig geblieben ist. So sind z. B. nach der vom *Reichs-Versicherungsamt* veröffentlichten

Unfallstatistik vom Jahre 1887 fast 7,000 Unfälle (d. s. 43% aller entschädigungspflichtigen Unfälle) durch die Gefährlichkeit der Betriebe entstanden, so dass zur Zeit eine Verhütung dieser Unfälle bei dem heutigen Stande der Technik nicht möglich erscheint. Diese Zahlen sprechen mehr als alle Kommentare für die Nothwendigkeit, dass immer mehr auf eine Verbesserung der Gewerbehygiene und Unfallverhütung

Jahr	Anzahl der Versicherten	Angemeldete Unfälle	Darunter entschädigungspflichtige Unfälle	Von diesen entschädigungspflichtigen Unfällen endeten.			
				tödtlich	mit dauernder völliger Erwerbsunfähigkeit	mit dauernder theilweiser Erwerbsunfähigkeit	mit vorübergehender Erwerbsunfähigkeit
1	2	3	4	5	6	7	8
1886	3,725,313	100,159 = 26·9 auf 1,000 Versicherte	10,540 = 10·5 % von Sp. 3	2,716 = 25·8 % von Sp. 4	1,778 = 16·8 % von Sp. 4	3,961 = 37·6 % von Sp. 4	2,085 = 19·8 % von Sp. 4
1887	4,121,537	115,475 = 28·0 auf 1,000 Versicherte	17,102 = 14·8 % von Sp. 3	3,270 = 19·1 % von Sp. 4	3,166 = 18·5 % von Sp. 4	8,462 = 49·5 % von Sp. 4	2,204 = 12·9 % von Sp. 4
1888	10,343,678	138,057 = 13·4 auf 1,000 Versicherte	21,236 = 15·4 % von Sp. 3	3,692 = 17·4 % von Sp. 4	2,216 = 10·4 % von Sp. 4	11,097 = 52·3 % von Sp. 4	4,231 = 19·9 % von Sp. 4
1889	13,374,566	174,874 = 13·1 auf 1,000 Versicherte	31,449 = 18·0 % von Sp. 3	5,260 = 16·7 % von Sp. 4	2,908 = 9·3 % von Sp. 4	16,547 = 52·6 % von Sp. 4	6,734 = 21·4 % von Sp. 4
1890	13,619,750	200,001 = 14·7 auf 1,000 Versicherte	42,038 = 21·0 % von Sp. 3	6,047 = 14·4 % von Sp. 4	2,708 = 6·4 % von Sp. 4	22,905 = 54·5 % von Sp. 4	10,378 = 24·7 % von Sp. 4
1891	17,382,827	225,337 = 13·0 auf 1,000 Versicherte	51,209 = 22·7 % von Sp. 3	6,428 = 12·5 % von Sp. 4	2,595 = 5·1 % von Sp. 4	28,097 = 54·9 % von Sp. 4	14,089 = 27·5 % von Sp. 4
1892	18,014,280	236,265 = 13·1 auf 1,000 Versicherte	55,654 = 23·6 % von Sp. 3	5,911 = 10·6 % von Sp. 4	2,664 = 4·8 % von Sp. 4	30,992 = 55·7 % von Sp. 4	16,087 = 28·9 % von Sp. 4
1893	18,118,850	264,130 = 14·6 auf 1,000 Versicherte	62,729 = 23·8 % von Sp. 3	6,336 = 10·1 % von Sp. 4	2,507 = 4·0 % von Sp. 4	36,670 = 58·5 % von Sp. 4	17,216 = 27·4 % von Sp. 4
1894	18,191,747	282,982 = 15·6 auf 1,000 Versicherte	69,619 = 24·6 % von Sp. 3	6,361 = 9·1 % von Sp. 4	1,784 = 2·6 % von Sp. 4	39,487 = 56·7 % von Sp. 4	21,987 = 31·6 % von Sp. 4
1895	18,389,468	310,139 = 16·9 auf 1,000 Versicherte	75,527 = 24·4 % von Sp. 3	6,448 = 8·5 % von Sp. 4	1,706 = 2·3 % von Sp. 4	41,052 = 54·4 % von Sp. 4	26,321 = 34·8 % von Sp. 4

hingearbeitet werden muss. Dass die dahin zielenden Bemühungen der Berufsgenossenschaften, Reichs- und Staatsbehörden einigen Erfolg aufzuweisen haben, geht aus vorstehender Tabelle hervor, welche nach den in den "Amtlichen Nachrichten des Reichs-Vesicherungsamts" Jahrgang 1888–1897 veröffentlichten Rechnungsergebnissen der Berufsgenossenschaften aufgestellt ist. Die Tabelle umfasst die Unfälle bei den gewerblichen und landwirthschaftlichen Berufsgenossenschaften, den staatlichen und kommunalen Ausführungsbehörden, sowie den bei den Baugewerksberufsgenossenschaften errichteten Versicherungsanstalten, ist also auf möglichst breiter Basis angelegt, um genügend grosse Beobachtungszahlen zu bekommen, was bei der verhältnissmässig kurzen Beobachtungszeit (10 Jahre) nothwendig war. Ich bemerke hierbei, dass die Zahl der in Spalte 2 aufgeführten Versicherten etwas zu hoch sein dürfte, da einige Versicherte doppelt gezählt sein werden.

Die *vorübergehende* Erwerbsunfähigkeit (Spalte 8) umfasst die Unfälle, bei welchen eine vollständige Wiederherstellung der Erwerbsfähigkeit bis zum Zeitpunkte der Ausfüllung der betreffenden Tabellen seitens der Berufsgenossenschaften etc. eintrat oder im weiteren Verlaufe zu erwarten war, die *dauernde völlige* Erwerbsunfähigkeit (Spalte 6) alle Unfälle bei welchen zur Zeit der Ausfüllung der Tabellen eine völlige Erwerbsunfähigkeit feststand oder als bestimmt eintretend vorauszusetzen war. Alle übrigen Fälle sind, soweit sie nicht als *tödtliche* Unfälle (Spalte 5) anzusehen waren, unter *dauernde theilweise* Erwerbsunfähigkeit (Spalte 7) aufgenommen worden.

Nach der vorstehenden Tabelle scheint allerdings eine Vermehrung der Unfälle seit dem Inkrafttreten der Arbeiterversicherungsgesetze eingetreten zu sein, wenigstens bei den entschädigungspflichtigen Unfällen (Spalte 4) und bei den leichteren mit vorübergehender Erwerbsunfähigkeit verbundenen Unfällen (Spalte 8), während bei den mit dauernder theilweiser Erwerbsunfähigkeit verbundenen Unfällen (Spalte 7), bei denen früher eine Steigerung sich gezeigt hatte, in den letzten beiden Jahren wieder ein Abfallen beobachtet werden konnte. Jene Vermehrung der *leichteren* Unfälle ist aber nur eine scheinbare. Je länger die Arbeiterversicherung besteht, desto bekannter werden ihre Vorschriften in den betheiligten Kreisen und desto mehr erkennen dieselben die Vortheile der Versicherung und suchen sie für sich zu benutzen. Daher kommt es, dass jetzt Schadenfälle als Unfälle angemeldet werden, die früher Niemand beachtet hat, z. B. geringfügige Verletzungen der Hand, des Fusses, des Schienbeins. Die Vermehrung der leichteren Unfälle wird daher voraussichtlich allmälig nachlassen und in einen etwas schwankenden Beharrungszustand übergehen, wie er schon jetzt theilweise zu beobachten ist. Entschieden ist der bessernde Einfluss der Unfallversicherung aber bei den *schwereren*, mit tödtlichem Ausgange bezw. dauernder völliger Erwerbsunfähigkeit verbundenen Unfällen (Spalte 5 und 6) zu konstatiren, bei denen zwar nicht die absoluten Zahlen, wohl aber die allein massgebenden Relativzahlen erheblich gesunken sind und zwar bei Unfällen

mit tödtlichem Ausgange von 25. 8 auf 8. 5 %,
mit nachfolgender dauernder völliger Erwerbsunfähigkeit von 16. 8 auf 2. 3 %

der sämmtlichen entschädigungspflichtigen Unfälle. Und diese

Abnahme der schweren Unfälle ist das Wichtigste, sowohl vom socialen, wie auch vom ethischen Standpunkte. Denn der Schaden für das Wohl der Familie und für das Allgemeinwohl ist bei vorübergehender Erwerbsunfähigkeit, ja selbst bei dauernder theilweiser Erwerbsunfähigkeit nicht annähernd so gewaltig, wie bei dauernder völliger Erwerbsunfähigkeit oder gar beim Tode der Ernährers. Während der Verletzte beim Vorhandensein eines bestimmten Grades von Erwerbsfähigkeit noch ein nützliches Mitglied der menschlichen Gesellschaft bleibt, bildet der völlig erwerbsunfähige Arbeiter eine fortwährende Last und reisst der Tod des Ernährers eine unausfüllbare Lücke in das Familienleben.

Ähnlich wie die Krankenversicherung, so hat auch die Unfallversicherung auf sanitärem Gebiete insofern Nutzen gestiftet, als die Berufsgenossenschaften es sich haben angelegen sein lassen, durch Gründung von Krankenhäusern (besonders die Knappschaftsberufsgenossenschaft), Reconvaleszentenanstalten, medico-mechanischen Instituten etc. für eine möglichst gründliche Heilung der Unfallverletzten Sorge zu tragen. Ein in dieser Beziehung sehr segensreich wirkendes Institut sind auch die von den Berufsgenossenschaften in Berlin gegründeten Unfallstationen, welche theilweise an die schon bestehenden Sanitätswachen angegliedert sind und mit ihrem organisirten Krankentransportwesen ein vorzügliches Rettungsinstitut abgeben und in der kurzen Zeit ihres Bestehens (seit 1894) bereits Vorzügliches geleistet haben. Dieselben, ursprünglich nur für Zwecke der Berufsgenossenschaften gegründet, sind jetzt für jedermann bestimmt und erfreuen sich auch schon einer erheblichen Popularität. Die 14 Unfallstationen sind Tag und Nacht geöffnet. Sie sind chirurgische Verbandstätten für erste Hilfe und besitzen bereits 7 Depots mit 10 eigenen Krankenwagen. Mit 3 der Stationen (den Hauptstationen) sind Kliniken von 20–30 Betten verbunden, welche jedoch Privatinstitute der betreffenden leitenden Ärzte sind. Ein Theil der Berliner Krankenkassen ist bereits zu den Unfallstationen in ein festes Vertragsverhältniss getreten. Die Stationen leisten den Ärzten keine unreelle Konkurrenz; denn wenn sie Unbemittelten gegenüber auch nicht rigoros verfahren und die erste Hilfe, ohne vorher nach Bezahlung zu fragen, leisten, so lassen sie sich doch von Personen, welche dazu im Stande sind, ihre Dienste bezahlen. Die Hilfe der Unfallstationen ist in den letzten Jahren jährlich von weit über 20,000 Personen in Anspruch genommen worden.

Endlich scheint die Unfallversicherung auf die Trunksucht bessernd eingewirkt zu haben. Dies erkennt auch ein seitens des "Deutschen Vereins gegen den Missbrauch geistiger Getränke" bei Gelegenheit der "Deutschen Allgemeinen Ausstellung für Unfallverhütung" (Berlin 1889) herausgegebenes Flugblatt an, indem es ausführt, dass in den an sich gefährlicheren unfallreicheren Gewerben die allgemeine Zwangsversicherung gegen den wirthschaftlichen Schaden der Unfälle, insofern sie die Berufsgenossen zu gegenseitiger Überwachung nöthigt, Arbeiter an Steingruben und ähnlichen Betrieben schon ohne Weiteres von selbst dahin gebracht habe, dass sie während der Arbeit dem Schnapse freiwillig ganz entsagen.

D. Invaliditäts- und Altersversicherung.

Entsprechend der Allerhöchsten Botschaft vom 17. November 1881 wurde der Arbeiterversicherung als Schlussstein die Invaliditäts- und Alterversicherung eingefügt. Ähnliche Einrichtungen waren bis dahin in Deutschland nur bei den schon mehrfach genannten Knappschaftsvereinen, sowie bei der Reichs- und bei der preussischen, sächsischen und bayerischen Staats-Eisenbahnverwaltung vorhanden. Ausserdem hatten einige grosse Betriebe aus eigener Initiative derartige Kassen gegründet.

Eingeleitet wurde die Einführung dieser Versicherungsart durch die am 17. November 1887, dem Jahrestage der oben erwähnten Allerhöchsten Botschaft, erfolgte Veröffentlichung der im Reichsamt des Innern ausgearbeiteten "Grundzüge zur Alters- und Invalidenversicherung der Arbeiter nebst einer Denkschrift," in welcher letzteren auch die *Wittwen- und Waisenfürsorge* insofern in Erwähnung gezogen wurde, indem dieselbe ausführt, dass die gleichzeitige Regelung der Wittwen- und Waisenfürsorge zwar erwünscht wäre, dass es sich jedoch empfehle, diesen Theil der socialpolitischen Gesetzgebung zunächst noch nicht in Angriff zu nehmen, um zuvor durch die bei der Durchführung der Alters- und Invalidenversicherung zu sammelnden Erfahrungen zu einem zutreffenderen Urtheile unter Anderem auch darüber zu gelangen, ob die Industrie und die anderen in Betracht kommenden Berufszweige die mit der Wittwen- und Waisenversorgung nothwendig verknüpfte erhebliche Mehrbelastung zu tragen im Stande wären. Diese Grundzüge beabsichtigten für die Invaliditäts- und Alterversicherung bei jeder Berufsgenossenschaft nach Art der Versicherungsanstalten für Regiebauten bei den Baugewerksberufsgenossenschaften eine Versicherungsanstalt zu errichten. Nachdem noch der preussische Volkswirthschaftsrath über die Grundzüge gehört worden war, wurde ein förmlicher Gesetzentwurf ausgearbeitet und im April 1888 dem Bundesrathe vorgelegt, gelangte jedoch nicht an den Reichstag. Dieser Entwurf wurde vielmehr nach den Beschlüssen des Bundesraths umgearbeitet und nochmals (im Juli 1888) veröffentlicht. Nachdem sich über diese neue Veröffentlichung Theorie und Praxis abermals geäussert hatten, wurde der Entwurf von dem Bundesrathe einer nochmaligen Überarbeitung unterzogen und sodann mit einer ausführlichen Begründung sowie mit einer, die statistischen und mathematischen Grundlagen erörternden Denkschrift gegen Ende 1888 dem Reichstage vorgelegt. Hier folgte eine sehr eingehende Behandlung sowohl in den Kommissionen als auch im Plenum, aus welcher das definitive Reichsgesetz, betreffend die Invaliditäts- und Altersversicherung, vom 22. Juni 1889 hervorging.

Unter dieses Gesetz fallen vom vollendeten 16. Lebensjahre ab:

1. Personen, welche als Arbeiter, Gehülfen, Gesellen, Lehrlinge oder Dienstboten gegen Lohn oder Gehalt beschäftigt werden;

2. Betriebsbeamte sowie Handlungsgehülfen und -Lehrlinge (ausschliesslich der in Apotheken beschäftigten Gehülfen und Lehrlinge), welche Lohn oder Gehalt beziehen, deren regelmässiger Jahresarbeitsverdienst an Lohn oder Gehalt aber 2,000 M. nicht übersteigt, sowie

3. die gegen Lohn oder Gehalt beschäftigten Personen der

Schiffsbesatzung deutscher Seefahrzeuge und von Fahrzeugen der Binnenschiffahrt.

Eine Beschäftigung, für welche als Entgelt nur freier Unterhalt gewährt wird, gilt im Sinne dieses Gesetzes nicht als eine die Versicherungspflicht begründende Beschäftigung.

Durch Beschluss des Bundesraths kann die Versicherungspflicht ausgedehnt werden

1. auf Betriebsunternehmer, welche nicht regelmässig wenigstens einen Lohnarbeiter beschäftigen, sowie
2. ohne Rücksicht auf die Zahl der von ihnen beschäftigten Lohnarbeiter auf solche selbständige Gewerbetreibende, welche in eigenen Betriebsstätten im Auftrage und für Rechnung anderer Gewerbetreibenden mit der Herstellung oder Bearbeitung gewerblicher Erzeugnisse beschäftigt werden (Hausgewerbetreibende).

Gemäss dieser Ermächtigung hat der Bundesrath die Versicherungspflicht auf die Hausgewerbetreibenden der Tabackfabrikation und der Textilindustrie ausgedehnt.

Befreit von der Versicherungspflicht sind:

1. Beamte des Reichs und der Bundesstaaten, die mit Pensionsberechtigung angestellten Beamten von Kommunalverbänden oder anderen öffentlichen Verbänden, sowie Personen des Soldatenstandes, welche dienstlich als Arbeiter beschäftigt werden;
2. Personen, welche in Folge ihres körperlichen oder geistigen Zustandes dauernd nicht mehr im Stande sind, durch eine ihren Kräften und Fähigkeiten entsprechende Lohnarbeit mindestens ein Drittel des für ihren Beschäftigungsort festgesetzten Tagelohnes gewöhnlicher Tagearbeiter zu verdienen (Invaliden), sowie solche Personen, welche auf Grund des vorliegenden Gesetzes bereits Invalidenrente beziehen.

Auf ihren Antrag können befreit werden:

3. Solche Personen, welche vom Reich, von einem Bundesstaate oder einem Kommunalverbande Pensionen oder Wartegelder wenigstens im Mindestbetrage der Invalidenrente beziehen oder welchen auf Grund der reichsgesetzlichen Bestimmungen über Unfallversicherung der Bezug einer Rente im Mindestbetrage der Invalidenrente zusteht.

Durch Beschluss des Bundesraths können von der Versicherungspflicht befreit werden vorübergehende Dienstleistungen. Auf Grund dieser Ermächtigung hat der Bundesrath unter anderen befreit: Personen, welche ohne berufsmässige Lohnarbeiter zu sein, nur nebenher oder gegen ein ganz geringfügiges Entgelt oder zur Hülfeleistung bei Unglücksfallen etc. thätig sind; Personen, welche im Auslande auf Seeschiffen—ohne zur Schiffsbesatzung zu gehören—Dienstleistungen verrichten; Aufwärter und Aufwärterinnen sowie ähnliche zu niederen äuslichen Diensten von kurzer Dauer an wechseln den Arbeitsstellen thätige Personen; endlich Dienstleistungen, welche in Verpflegungsstationen oder in ähnlichen Einrichtungen gegen eine Geldentschädigung

verrichtet werden, welche nicht als Entgelt für gelieferte Arbeit, sondern als eine Unterstützung zum Zweck des besseren Fortkommens gewährt wird.

Neben der Versicherungspflicht kennt das Gesetz eine *freiwillige* Versicherung, welche in zwei Formen erscheint: Einmal als *Selbstversicherung* (freiwilliger Eintritt in die Versicherung). Dieselbe ist kleinen Betriebsunternehmern und den Hausgewerbetreibenden gestattet, welche der Bundesrath nicht kraft der ihm durch das Gesetz gegebenen Ermächtigung (siehe oben) der Versicherungspflicht unterworfen hat, und welche das 40. Lebensjahr noch nicht vollendet haben. Zweitens als *freiwillige Fortsetzung des Versicherungsverhältnisses.* Diese ist zugelassen für Versicherte, welche aus der Zwangs- oder Selbstversicherung ausscheiden würden, weil die diese Verhältnisse begründenden Voraussetzungen nicht mehr zutreffen, ohne Rücksicht ob dieses Ausscheiden dauernd oder nur vorübergehend (z. B. bei vorübergehender Arbeitslosigkeit) sein würde. Eine Abart hiervon ist die *freiwillige Erneuerung eines Versicherungsverhältnisses*, welches durch mehr oder minder längere Nichtzahlung der Beiträge bereits erloschen war.

Die Selbstversicherung und die freiwillige Fortsetzung des Versicherungsverhältnisses dürfen im Allgemeinen nur in Lohnklasse II (siehe später) stattfinden; auch haben die betreffenden Versicherten neben der gewöhnlichen Beitragsmarke noch eine Zusatzmarke (beide vereinigt in einer sogenannten Doppelmarke) beizubringen. Ausnahmen finden statt: (*a*) für kleine Betriebsunternehmer, welche in der Regel nicht mehr als einen Lohnarbeiter beschäftigen, wenn dieselben früher während mindestens 5 Beitragsjahren versicherungspflichtig waren und für sie während dieser Zeit entsprechende Beitragsmarken verwendet sind, bezüglich der freiwilligen Fortsetzung oder Erneuerung des Versicherungsverhältnisses; (*b*) für höchstens 4 Monate in dem Falle, dass ein ständiges Arbeitsverhältniss zu einem bestimmten Arbeitgeber zeitweise (z. B. wegen schlechter Witterung, Arbeitsmangel etc.) unterbrochen wird, um demnächst fortgesetzt zu werden. In beiden Ausnahmefällen brauchen Zusatzmarken nicht verwendet werden; in dem Falle zu "*b*" werden auch nicht ausschliesslich Marken II. Lohnklasse, sondern die in dem betreffenden Arbeitsverhältniss bisher benutzten Marken weiter verwendet.

Die Durchführung der Invaliditäts- und Altersicherung erfolgt unter staatlicher Garantie durch besondere *Versicherungsanstalten*, welche für weitere Kommunalverbände (Provinzen etc.) oder für das Gebiet eines Bundesstaates errichtet werden. Neben den Versicherungsanstalten können Kasseneinrichtungen, welche ihren Mitgliedern mindestens die gleiche Fürsorge gewähren, wie sie das Gesetz für alle Versicherungspflichtigen vorschreibt, als *besondere Kasseneinrichtungen* zur Durchführung zugelassen werden. Dieses Letztere ist bezüglich der Pensionskassen der Reichs- und staatlichen Eisenbahnverwaltungen sowie bezüglich der Pensionskassen der Knappschaftsvereine geschehen.

Es bestehen zur Zeit 31 Versicherungsanstalten und 9 besondere Kasseneinrichtungen (5 für Eisenbahnverwaltungen, 4 für Knappschaften) mit rund 11,585,000 versicherten Personen. Das Vermögen dieser 40 Institute betrug Ende 1895 rund 414,000,000 Mark.

Eine Anmeldung der versicherungspflichtigen Personen ist im Allgemeinen nicht vorgeschrieben. Nur in dem Falle, dass die Einzie-

hung der Beiträge durch besondere Hebestellen erfolgt, können Bestimmungen über die Verpflichtung zur Anmeldung und Abmeldung der Versicherten getroffen und Zuwiderhandlungen mit Geldstrafe bis zu 100 M. bedroht werden.

Gegenstand der Versicherung ist der Anspruch auf Gewährung

a. einer Invalidenrente bezw.
b. einer Altersrente.

Invalidenrente erhält ohne Rücksicht auf das Lebensalter derjenige Versicherte, welcher *dauernd* erwerbsunfähig ist. Erwerbsunfähigkeit ist dann anzunehmen, wenn der Versicherte in Folge seines körperlichen oder geistigen Zustandes nicht mehr im Stande ist, durch eine seinen Kräften und Fähigkeiten entsprechende Lohnarbeit mindestens einen Betrag zu verdienen, welcher sich zusammensetzt aus einem Sechstel der durchschnittlichen Lohnsätze, nach welchen für ihn zuletzt Beiträge entrichtet worden sind und einem Sechstel des dreihundertfachen Betrages des ortsüblichen Tagelohnes gewöhnlicher Tagearbeiter des letzten Beschäftigungsortes, in welchem er nicht lediglich vorübergehend beschäftigt gewesen ist. Invalidenrente erhält auch derjenige *nicht dauernd* erwerbsunfähige Versicherte, welcher während eines Jahres ununterbrochen erwerbsunfähig gewesen ist, für die weitere Dauer seiner Erwerbsunfähigkeit. Ist die Invalidität vorsätzlich oder bei Begehung eines Verbrechens zugezogen, so geht der Anspruch auf Invalidenrente verloren. Die Merkmale der Erwerbsunfähigkeit sind hier dieselben, wie bei der Unfallversicherung.

Altersrente erhält, ohne dass es des Nachweises der Erwerbsunfähigkeit bedarf, derjenige Versicherte, welcher das 70 Lebensjahr vollendet hat.

Die Invalidenrente ist die Hauptsache, und sie tritt ergänzend zu der nur für Betriebsunfälle eintretenden Unfallrente, damit der Arbeiter gegen alle Unfälle, die ihn betreffen können, sowie gegen Invalidität in Folge Alters oder Krankheit versichert ist.

Die Altersrente soll nur dem alten Arbeiter, der noch nicht invalide ist, ermöglichen, sich etwas zu schonen. Dass übrigens genug Personen 70 Jahre alt werden und in den Genuss der Altersrente treten, geht daraus hervor, dass nach dem Stande vom 31 December 1895 bei rund 11,585,000 Versicherten im Deutschen Reiche an 269,450 Personen, d.i. an 23·26‰ aller Versicherten, Altersrente bewilligt war, eine Zahl, die viel höher gewesen sein würde, wenn nicht vielfach die erforderlichen Bescheinigungen gefehlt hätten. Noch interessanter ist es, wenn man die Verhältnisse in der entschieden die höchsten Anforderungen an die Geschäftstüchtigkeit und Arbeitskraft der erwerbsthätigen Bevölkerung stellenden Reichs-Hauptstadt Berlin betrachtet. In Berlin ist nach dem Stande vom 31. December 1895 bei rund 460,000 Versicherten an 3,017 Personen, d.i. an 6·56‰ aller Versicherten, Altersrente bewilligt worden, von denen der älteste Rentenempfänger im Jahre 1,799 geboren war. Unter jenen 3,017 Altersrentenempfängern waren 2,162 Männer und 855 Frauen; und zu diesen stellte wiederum das grösste Kontingent die Industrie, besonders die Metallindustrie, während der in Berlin vorherrschende Handel und Verkehr unter den Altersrentenempfängern nur verhältnissmässig gering vertreten ist. Es erlangen also genug Versicherte das zum

Bezug der Altersrente erforderliche Alter; trotzdem halte ich eine Herabsetzung der Altersrente für dringend erwünscht, denn jenen alten Leuten ist bei den heute in der Industrie und im Handel, ja theilweise sogar in der Landwirthschaft üblichen Grundsätzen schon lange vor jenem Alter das Erlangen von Arbeitsgelegenheit erschwert. Die Zeiten, wo der alte Arbeitnehmer auch bei verminderter Arbeitsfähigkeit seine Beschäftigung behielt, sind vorüber, und nur in einzelnen grossen Werken und Fabriken sowie auf dem platten Lande auf grösseren Gütern findet man jenes patriarchalische Verhältniss noch vor. Selbst der Handel, der sich die alten Verhältnisse noch am längsten bewahrt hat, geht immer mehr und mehr davon ab und sucht sein Personal zu verjüngen, ohne aber zugleich für das ältere und verbrauchte Material Sorge zu tragen. Unter diesen Umständen wäre es wünschenswerth, dass dem alten Arbeiter durch früheren Beginn der Altersrente schon früher als jetzt die Sorge für sich und die Seinen erleichtert würde.

Die Erlangung eines Anspruchs sowohl auf Invaliden- als auch auf Altersrente ist abhängig von

(1) der Zurücklegung der vorgeschriebenen Wartezeit,
(2) der Leistung von Beitragen.

Die Wartezeit (Karenzzeit) beträgt:

(*a*) bei der Invalidenrente 5 Beitragsjahre,
(*b*) bei der Altersrente 30 Beitragsjahre.

Als Beitragsjahr gelten 47 Beitragswochen. Hierbei werden die Beitragswochen, auch wenn sie in verschiedene Kalenderjahre fallen, bis zur Erfüllung des Beitragsjahres zusammengerechnet. Zeiten mit Erwerbsunfähigkeit verbundener Krankheit, welche ein festes Arbeitsverhältniss unterbrechen, sowie Zeiten militärischer Dienstleistungen werden sowohl bei der Berechnung der Wartezeit, als auch bei der Berechnung der Rente und zwar in der II. Lohnklasse angerechnet. Krankheiten, welche sich der Versicherte vorsätzlich, bei Begehung eines Verbrechens, durch schuldhafte Betheiligung bei Schlägereien etc., durch Trunkfälligkeit oder geschlechtliche Ausschweifungen zugezogen hat, werden nicht angerechnet, ebenso nicht bei einer länger als ein Jahr währenden Krankheit die über diese Zeit hinausgehende Krankheitsdauer.

Da nun bei einer strikten Innehaltung der Wartezeit die alten Arbeiter, für welche doch, ebenso wie für die jungen, Beiträge gezahlt werden müssen, niemals in den Bezug einer Altersrente und ein grosser Theil auch nicht in den Bezug einer Invalidenrente gekommen wäre, so hat das Gesetz für diesen Fall Übergangsbestimmungen getroffen, indem es den in den ersten 5 Jahren nach Inkrafttreten des Gesetzes invalide gewordenen Versicherten für die *Invalidenrente* vorgesetzliche Arbeitszeiten und den beim Inkrafttreten des Gesetzes bereits über 40 Jahre alten Versicherten für die *Altersrente* die beim Inkrafttreten des Gesetzes das 40. Lebensjahr überschiessenden Jahre und Wochen unter gewissen Voraussetzungen anrechnet. Hierbei werden Krankheitszeiten und Zeiten militärischer Dienstleistungen unter den vorstehenden Bedingungen sowie auch vorübergehende Unterbrechungen eines festen Arbeitsverhältnisses bis zur Dauer von 4 Monaten in einem Kalenderjahr mit eingerechnet.

Zum Zwecke der Bemessung der Beiträge und Renten werden nach der Höhe des Jahresarbeitsverdienstes folgende Klassen der Versicherung (Lohnklassen) gebildet:

Klasse I bis zu 350 M. einschliesslich,
„ II von mehr als 350 bis 550 M.,
„ III von mehr als 550 bis 850 M.,
„ IV von mehr als 850 M.

Als Jahresarbeitsverdienst gilt nicht der wirkliche Arbeitsverdienst des einzelnen Arbeiters, sondern der von den Verwaltungsbehörden für die verschiedenen Orte oder Bezirke bezw. der von den Krankenkassen für die Berechnung ihrer Beiträge festgesetzte ortsübliche Tagelohn oder durchschnittliche Jahresarbeitsverdienst. Bei der Berechnung der Rente kommt unterschiedlich von der Kranken- und Unfallversicherung die in der Privatversicherung übliche Aequivalenztheorie zur Anwendung, d.h. die Höhe der Rente ist abhängig von der Höhe und Zahl der wirklich gezahlten Beiträge. Über den Werth dieser Theorie in der öffentlich-rechtlichen Arbeiterversicherung Deutschlands ist viel hin und her gestritten worden; immer wieder und wieder tritt in der Fachliteratur und Fachpresse die Forderung nach einer Einheitsrente auf. Die Gründe des Gesetzgebers für Einführung dieser Theorie waren hauptsächlich: der dadurch zu ermöglichende Ausgleich zwischen den Renten der höher gelohnten Industriearbeiter in den theuren Industriebezirken und den Renten der geringer gelohnten landwirthschaftlichen Arbeiter in den billigeren landwirthschaftlichen Gegenden sowie das Bestreben, den Arbeiter durch die Aussicht auf eine höhere Rente bei längerer Beitragsleistung zum längeren Aushalten bei der Arbeit anzuspornen. Beide Gründe sind nicht ohne Weiteres von der Hand zu weisen, und hat die Theorie vom versicherungstechnischen Standpunkte auf den ersten Anblick viel Bestechendes für sich, weil sie das Risico nicht nur von dem Wahrscheinlichkeitskoëfficienten sondern auch von den wirklichen Thatsachen, also von feststehenden Grössen abhängig macht. Deswegen war die Aequivalenztheorie für den Anfang und die erste Zeit des Bestehens der Invaliditäts- und Altersversicherung durchaus nicht ohne Werth, da letztere zum grossen Theile auf Hypothesen aufgebaut war. Nachdem jetzt aber bereits genügende statistische Erfahrungen gesammelt sind, um die Mängel der bei Aufstellung des Gesetzes benutzten Tabellen und aufgestellten Grundsätze beurtheilen und dieselben berichtigen zu können, halte ich die Abschaffung der Aequivalenztheorie und die Einführung der Einheitsrente für angezeigt. Die von dem Gesetzgeber für seine Massregel angeführten Gründe können hierbei nicht in Betracht kommen, denn *örtliche* Interessen brauchen bei der fluctuirenden Natur unserer Arbeiterbevölkerung meines Erachtens nicht berücksichtigt werden, und *persönliche* Interessen können auf andere Weise gewahrt werden. So könnten z.B. statt Lohnklassen Berufsklassen gebildet werden, mit verschieden hohen Beiträgen und Renten, vielleicht

Klasse I Dienstboten und Lehrlinge,
„ II Landwirthschaftliche Arbeiter,
„ III Industrie- und Bauarbeiter sowie Seeleute.

Innerhalb jeder dieser Klassen dürfte es nur eine Rentenhöhe und

dementsprechend Beitragshöhe geben. Der Wechsel der Berufsstellung würde dabei nichts schaden, da dieser Wechsel wohl meist nach oben zu geschieht und hierauf bei Bemessung der Beiträge Rücksicht genommen werden könnte. Bei eintretender Rentenberechtigung würde dann jeder die Rente derjenigen Klasse bekommen, zu der er in der letzten Zeit (vielleicht in den letzten 2 Jahren) überwiegend gesteuert hat. Natürlich müsste es denjenigen Personen, welche im Laufe der Versicherung aus einer höheren in eine niedere Klasse übertreten, gestattet sein, ihre höhere Versicherung durch freiwillige Weiterzahlung der höheren Beiträge aufrecht zu erhalten. Durch eine derartige Eintheilung nach Berufsklassen würden die Unsicherheiten verschwinden, welche dadurch entstehen, dass in einem Orte für gleiche Arbeiterkategorien (je nach der Art der Krankenkasse, der sie angehören, etc.) verschiedene Beitragshöhen bestehen, oder, was ebenso unverständlich ist, dass in zwei Nachbarorten, welche gleiche Verhältnisse haben, vielleicht nur deshalb, weil sie in 2 verschiedenen Verwaltungsbezirken liegen, verschiedene Marken für einen und denselben Arbeiter verwendet werden müssen. Eine Einheitsrente würde aber die Rentenberechnung und -Festsetzung sehr vereinfachen.

Die Renten werden für Kalenderjahre berechnet. Sie bestehen aus einem von der Versicherungsanstalt aufzubringenden Betrage und aus einem festen Zuschusse des Reichs, welcher letztere für jede Rente ohne Unterschied, ob Alters- und Invalidenrente, jährlich 50 M. beträgt.

Bei der Berechnung des von der Versicherungsanstalt aufzubringenden Theiles der *Invalidenrente* wird ein Betrag von 60 M. zu Grunde gelegt. Derselbe steigt mit jeder vollendeten Beitragswoche:

in der	Lohnklasse	I	um 2	Pfennig,
„ „	„	II	„ 6	„
„ „	„	III	„ 9	„
„ „	„	IV	„ 13	„ .

Der von der Versicherungsanstalt aufzubringende Theil der *Altersrente* beträgt für jede Beitragswoche:

in	Lohnklasse	I	4	Pfennig,
„	„	II	6	„
„	„	III	8	„
„	„	IV	10	„ .

Dabei werden für die Altersrente mindestens, aber auch nicht mehr, als 30 Beitragsjahre oder $30 \times 47 = 1{,}410$ Beitragswochen in Anrechnung gebracht. Sind für einen Versicherten Beiträge für mehr als 1,410 Beitragswochen in verschiedenen Lohnklassen entrichtet, so werden für die Berechnung diejenigen 1,410 Beitragswochen in Ansatz gebracht, in denen die höchsten Beiträge entrichtet worden sind.

Die Renten sind in monatlichen Theilbeträgen im Voraus (praenumerando) zu zahlen. Dieselben sind auf volle 5 Pfennig für den Monat nach oben abzurunden.

Um hiernach eine Darstellung von der Höhe der Renten zu geben, werde ich im Nachstehenden einige derselben anführen: Dieselben sind bereits abgerundet und sind in der Voraussetzung aufgestellt, dass für

die betreffenden Versicherten stets nur Marken *einer* Lohnklasse verwendet worden sind. In der Wirklichkeit wird dies nur selten vorkommen, vielmehr werden bei dem Fluctuiren der deutschen Arbeiterbevölkerung und bei der örtlichen Verschiedenheit in der Höhe der zu verwendenden Marken für die einzelnen Versicherten im Laufe der Zeit meist Marken verschiedener Lohnklassen verwendet sein.

Da für einen Versicherten, wenn er Invalidenrente erhalten will, mindestens während 5 Beitragsjahren (235 Beitragswochen) Beiträge entrichtet worden sein müssen, so beträgt die mindeste Invalidenrente jährlich

In Lohnklasse	I . .	115·20	M.
„ „	II . .	124·20	„
„ „	III . .	131·40	„
„ „	IV . .	141	„

Nach Ablauf von 50 Beitragsjahren (2,350 Beitragswochen)—einen bestimmten Höchstbetrag der Invalidenrente kennt das Gesetz nicht—beträgt die jährliche Invalidenrente

In Lohnklasse	I . .	157·20	M.
„ „	II . .	251·40	„
„ „	III . .	321·60	„
„ „	IV . .	415·80	„

Die Altersrente, bei welcher stets 30 Beitragsjahre (1,410 Beitragswochen) zur Anrechnung gelangen, beträgt

In Lohnklasse	I . .	106·80	M.,
„ „	II . .	135	„
„ „	III . .	163·20	„
„ „	IV . .	191·40	„.

Für die bei der Altersrente in der Übergangszeit anzurechnenden Wochen, für welche keine Beiträge entrichtet sind (siehe oben) kommen in den ersten 10 Jahren nach dem Inkrafttreten des Gesetzes (1. Januar 1891), die Steigerungssätze derjenigen Lohnklasse in Anrechnung, welche dem durchschnittlichen Jahresarbeitsverdienste des Versicherten während der dem Gesetze vorangegangenen letzten 3 Beitragsjahre (141 Beitragswochen) entsprechen, mindestens aber die der Lohnklasse I. Auch in diesem Falle kommen für die nachgesetzliche Zeit lediglich die wirklich verwendeten Beiträge in Betracht.

Über die in der Invaliditäts- und Alterversicherung obwaltenden Verhältnisse geben die nachstehenden Tabellen Auskunft:

I.

Versicherungsanstalten und besondere Kasseneinrichtungen	Zahl der im Jahre 1895 bei den Anstalten festgesetzten Renten		In den Jahren 1891-1895 endgültig zur Last gelegte Rentenantheile			Davon bestanden am 31 Dezember 1895 Rentenantheile	
	Invaliden-	Alters-	Anzahl	Jahresbetrag	Kapitalwerth	Anzahl	Jahresbetrag
				1,000 M.			1,000 M.
1.	2.	3.	4.	5.	6.	7	8.
Versicherungsanstalten . . .	52,062	29,417	417,164	29,024·1	194,212·4	306,100	21,446·0
Besondere Kassen-Einricht . .	3,843	615	16,489	1,231·9	9,567·2	12,095	900·7
Im Ganzen .	55,905	30,032	433,653	30,256·0	203,779·6	318,195	22,346·7

Die Zahl der Renten*antheile* deckt sich hierbei nicht mit derjenigen der Renten*empfänger*, da die Renten, an deren Aufbringung mehrere Versicherungsanstalten betheiligt sind, bei jeder derselben erscheinen.

II.

Versicherungs-Anstalten und besondere Kasseneinrichtungen	Im Jahre 1895 auf Anweisung der Versicherungs-Anstalten etc. gezahlte Beträge						Davon hat das Reich zu erstatten
	Invaliden-	Alters-	Renten zusammen	Erstattungen an verehelichte weibliche versich.	Hinterbliebene verstorbener Personen	überhaupt	
	Renten						
	1,000 Mark						
1.	2.	3.	4.	5.	6.	7.	8.
Versicherungsanstalten . .	14,223·9	25,997·9	40,221·8	158·5	53·5	40,433·8	16,215·7
Besondere Kassen-Einricht. .	1,301·7	578·5	1,880·2	0·1	7·3	1,887·6	597·7
Im Ganzen .	15,525·6	26,576·4	42,102·0	158·6	60·8	42,321·4	16,813·4

Vorhanden waren am Schlusse des Jahres 1895 überhaupt rund 347,700 Rentenempfänger. Die Einnahmen betrugen im Jahre 1895 rund 115,200,000 M., die Ausgaben 31,970,000 M.; der Reichszuschuss betrug 16,940,000 M.

III.—Durchschnitts-Ergebniss.

Rechnungsjahr	Auf 1 Versicherten kommen Mark					Jahresrente in Mark		Von 100 Versicherten erhalten			Von 100 Mark Rente sind	
	Beitrag	Reichs-Zuschuss	Rente	Verwaltung	Vermögen	Invaliden-	Alters-	Invaliden-	Alters-	Renten überhaupt	Invaliden-	Alters-
						Rente		Rente			Rente	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
Im 1. Jahr	8·21	0·54	1·36	0·40	7·09	113·51	125·08	0·00	1·20	1·20	0·00	100·00
Im 50. Jahr	18·00	6·00	27·34	0·40	125·33	225·60	135·00	11·40	1·20	12·60	94·07	5·93

Die allgemeinen Verwaltungsunkosten betragen in der Invaliditäts- und Altersversicherung rund 4% bis 5% der Gesammteinnahme.

Anträge auf Rente sind bei der für den Wohnort der Versicherten zuständigen unteren Verwaltungsbehörde (Landrath, in grösseren Städten Magistrat) anzumelden. Der Anmeldung sind die nöthigen Beweisstücke (Quittungskarte, Arbeitsbescheinigungen, ärztlichen Atteste) beizufügen. Die untere Verwaltungsbehörde hört die für den Wohnort des Versicherten ernannten Vertrauensmänner, giebt der Krankenkasse, welcher der Versicherte angehört bezw. angehört hat, Gelegenheit, sich zu äussern und giebt demnächst den Antrag gehörig begründet an den Vorstand derjenigen Versicherungsanstalt ab, deren Beitragsmarken ausweislich der Quittungskarte zuletzt verwendet worden sind. Hier wird der Antrag geprüft und werden, sofern der Antrag nicht ohne Weiteres abzuweisen ist, die früheren Quittungskarten von der diese aufbewahrenden Versicherungsanstalt (siehe später) eingefordert. Erscheinen die beigebrachten Beweisstücke zur Abgabe einer Entscheidung nicht ausreichend, so sind weitere Erhebungen zu veranlassen, deren Kosten der Versicherungsanstalt zur Last fallen. Wird der Anspruch anerkannt, so ist die Höhe der Rente sofort festzustellen und dem Empfangsberechtigten sodann ein schriftlicher Bescheid zu ertheilen, aus welcher die Art der Berechnung der Rente zu ersehen ist. Abschrift des Bescheides ist dem Staatskommissar (siehe später) zuzustellen. Wird der angemeldete Anspruch nicht anerkannt, so ist derselbe durch schriftlichen, mit Gründen versehenen Bescheid abzulehnen. Gegen die Entscheidungen, welche den Rentenanspruch ablehnen oder denselben feststellen, steht den Betheiligten Berufung an das Schiedsgericht und gegen dessen Entscheidungen Revision beim Reichs-Versicherungsamt offen. Die Revision kann jedoch nur darauf gestützt werden:

1. dass die angefochtene Entscheidung auf der Nichtanwendung oder auf der unrichtigen Anwendung des bestehenden Rechts oder auf einem Verstoss wider den klaren Inhalt der Akten beruhe;
2. dass das Verfahren an wesentlichen (formellen) Mängeln leide.

Das Verfahren bei beiden Rechtsmittelinstanzen ist kostenfrei.

Zur Anpassung an die bestehenden örtlichen Verhältnisse kann land- und forstwirthschaftlichen Arbeitern, die den Lohn herkömmlich zum Theil in Naturalien erhalten haben, nach ortsstatutarischer Bestimmung der betreffenden Gemeinden oder Bezirke auch die Rente zum Theil in Naturalien ausgezahlt erhalten. Notorischen Trunkenbolden kann die Rente überall ganz in Naturalien gegeben werden. Der Anspruch auf Rente geht zu demjenigen Betrage, in welchem Naturalleistungen gewährt werden, auf den Kommunalverband über, für dessen Bezirk derartige Bestimmungen getroffen sind, wogegen diesem die Leistung der Naturalien obliegt.

Eine Pfändung oder Übertragung der Rente ist im Allgemeinen nicht zulässig; nur gewisse Forderungen der Ehefrau, der ehelichen Kinder, der Armenverbände etc. machen hierbei eine Ausnahme.

Ist der zum Empfang der Rente Berechtigte ein Ausländer, so kann er, falls er seinen Wohnsitz im Deutschen Reiche aufgiebt, mit dem dreifachen Betrage der Jahresrente abgefunden werden.

Ändern sich die Verhältnisse des Empfängers einer Invali-

denrente derart, dass er nicht mehr als dauernd erwerbsunfähig erscheint, so kann ihm die Rente wieder entzogen werden.

Der erworbene Anspruch auf Rente ruht:

1. für diejenigen Personen, welche eine Unfallrente beziehen, solange und soweit die Unfallrente unter Hinzurechnung der Invaliden- bezw. Altersrente den Betrag von 415 M. übersteigt;

2. für Reichs-, Staats-, Communal- pp. Beamte und Personen des Soldatenstandes, solange und soweit die denselben gewährten Pensionen oder Wartegelder unter Hinzurechnung der Invaliden- bezw. Altersrente den Betrag von 415 M. übersteigen;

3. solange der Berechtigte eine die Dauer von einem Monat übersteigende Freiheitsstrafe verbüsst, oder solange er in einem Arbeitshause oder in einer Besserungsanstalt untergebracht ist;

4. solange der Berechtigte nicht im Inlande wohnt (ausgenommen einige Grenzbezirke).

Sobald die Höhe der bewilligten Renten endgültig feststeht, sendet der Vorstand der Versicherungsanstalt eine Ausfertigung des Bescheides und die Quittungskarten dem Rechnungsbureau des Reichs-Versicherungsamts ein.

Das aus Mathematikern bestehende Rechnungsbureau hat alle bei dem Reichs-Versicherungsamte vorkommenden rechnerischen und versicherungstechnischen Arbeiten auszuführen.

Das Rechnungsbureau vertheilt die Renten auf das Reich und die betheiligten Versicherungsanstalten. Die Vertheilung erfolgt, nachdem zunächst der dem Reich in Rechnung zu stellende Zuschuss ausgeschieden worden ist, in dem Verhältniss der Beiträge, welche den einzelnen Versicherungsanstalten für den Versicherten zugeflossen sind.

Gegen die Vertheilung, welche den betheiligten Versicherungsanstalten mitzutheilen ist, können diese Einspruch bei dem Reichs-Versicherungsamte einlegen, welches endgültig entscheidet. Sobald die auf die einzelnen Versicherungsanstalten entfallenden Rentenantheile endgültig feststehen, hat das Rechnungsbureau dem Vorstande der Versicherungsanstalt, welche die Rente festgesetzt hat, eine Ausfertigung der Vertheilung zu übersenden.

Die Auszahlung der Rente erfolgt durch die für den Wohnort der Berechtigten zuständigen Postanstalten. Zu diesem Zwecke erhalten die Rentenempfänger nach Feststellung ihrer Rente durch den Vorstand der Versicherungsanstalt einen Berechtigungsausweis, welcher sie den auszahlenden Stellen gegenüber legitimirt. Die Central-Postbehörden reichen dem Rechnungsbureau des Reichs-Versicherungsamts Nachweisungen über die von ihnen gezahlten Beträge ein. Demnächst vertheilt das Rechnungsbureau diese vorgeschossenen Beträge auf die betheiligten Versicherungsanstalten und übersendet denselben Nachweisungen über die ihnen zur Last fallenden Einzelbeträge. Ebenso ist dem Reichskanzler eine derartige Nachweisung über die dem Reiche zur Last fallenden Beträge zuzustellen. Den Central-Postbehörden hat das Rechnungsbureau nach Ablauf eines jeden Rechnungsjahres mitzutheilen, welche Beträge von dem Reiche und von den einzelnen Versicherungsanstalten zu erstatten sind. Die Versicherungsanstalten haben demnächst die auf sie entfallenden Beträge zu erstatten.

Die Erstattung erfolgt aus den bereiten Mitteln der Anstalt. Sind

solche nicht vorhanden und bietet auch der Reservefonds nicht solche dar, so hat der weitere Communalverband (Provinz etc.) bezw. der Bundesstaat die erforderlichen Beträge vorzuschiessen.

Die zur Durchführung der Versicherung erforderlichen Mittel werden durch das Reich, die Arbeitgeber und die Versicherten aufgebracht.

Die finanzielle Betheiligung des *Reiches* besteht zunächst darin, dass dasselbe zu jeder Rente einen jährlichen Zuschuss von 50 M. leistet und ausserdem denjenigen Antheil von Renten übernimmt, welcher auf die Dauer militärischer Dienstleistungen der Versicherten entfällt. Da nun das Reich an der freiwilligen Versicherung nicht das gleiche Interesse hat, wie an der Zwangsversicherung, die erstere ihm auch nicht das gleiche Maass socialpolitischer Verpflichtung auferlegt, wie die von ihm aufgezwungene Zwangsversicherung, so müssen die freiwillig sich versichernden Personen, wie schon vorn ausgeführt ist, als Aequivalent für den bei allen Renten gewährten Reichszuschuss im Allgemeinen eine Zusatzmarke, welche 8 Pfennig für die Beitragswoche kostet und mit der eigentlichen Beitragsmarke zu einer sogenannten Doppelmarke verbunden ist, verwenden, wobei nur für wenige auch bereits vorn aufgezählte Kategorieen der zur freiwilligen Versicherung berechtigten Personen Ausnahmen zugelassen sind. Die für seine Leistungen erforderlichen Geldmittel bringt das Reich in derselben Weise auf, wie seine sonstigen Bedürfnisse, nämlich durch alljährliche Einstellung des Bedarfs in den Reichshaushalts-Etat.

Die nach Abzug der vom Reiche zu tragenden Antheile an den Renten noch übrig bleibenden Kosten (Renten, Verwaltungsunkosten etc.) werden durch laufende Beiträge aufgebracht, welche auf die *Arbeitgeber* und *Arbeitnehmer* zu gleichen Theilen entfallen.

Nachdem man schon bei der Unfallversicherung im Zweifel war über den bei Aufbringung der Mittel einzuschlagenden Weg, begegnete man bei Einrichtung der Invaliditäts- und Altersversicherung denselben Bedenken. Die Regierung wollte das Prämiensystem mit Ansammlung von Deckungskapitalien einführen, während die Industrie lebhaft für Einführung des in der Unfallversicherung überwiegenden Umlageverfahrens eintrat. Beide Systeme gelangten nicht zum Siege. Es wurde vielmehr ein Zwischenweg gewählt und das sogenannte Kapitaldeckungsverfahren angewandt, welches auch in der Unfallversicherung (bei der Tiefbauberufsgenossenschaft und den Versicherungsanstalten der Hochbauberufsgenossenschaften) theilweise schon Einführung gefunden hat. Nach demselben sollen für gewisse Perioden (zuerst 10, dann je 5 Jahre) die Beiträge so bemessen werden, dass durch sie die Kapitalwerthe der in dieser Periode zur Feststellung gelangenden Renten gedeckt werden, dass aber abweichend von dem Prämiensystem von einer weitergehenden Deckung auch der Anwartschaften der noch aktiven Versicherten abgesehen wird.

Die Höhe der für die erste Beitragsperiode geltenden Beiträge ist auf Grund versicherungstechnischer Berechnung durch das Gesetz selbst festgelegt und beträgt wöchentlich:

in Lohnklasse	I	.	.	14	Pfennig
„ „	II	.	.	20	„
„ „	III	.	.	24	„
„ „	IV	.	.	30	„

Für die späteren Beitragsperioden ist nach obigem die Höhe der Beiträge unter Berücksichtigung der in Folge von Krankheiten entstehenden Ausfälle so zu bemessen, dass durch dieselben gedeckt werden die Verwaltungsunkosten, die Rücklagen zur Bildung eines Reservefonds (siehe später), die durch Erstattung von Beiträgen (siehe später) voraussichtlich entstehenden Aufwendungen, sowie der Kapitalwerth der von der Versicherungsanstalt aufzubringenden Antheile an denjenigen Renten, welche in dem betreffenden Zeitraume voraussichtlich zu bewilligen sein werden. Dabei sind Ausfälle oder Überschüsse, welche sich aus der Erhebung der bisherigen Beiträge rechnungsmässig herausgestellt haben, in der Weise zu berücksichtigen, dass durch die neuen Beiträge eine Ausgleichung eintritt.

Die Feststellung der Beitragshöhen erfolgt durch den Ausschuss der Versicherungsanstalt unter Anhörung des Vorstandes derselben und unter demnächstiger Genehmigung der bezüglichen Beschlüsse durch das Reichs-Versicherungsamt.

Mehrfach ist nun die Frage aufgeworfen und bezweifelt worden, ob die bei Einführung der Invaliditäts- und Altersversicherung benutzten versicherungstechnischen Unterlagen sich bewährt haben. Besonders werden diese Zweifel von Freunden des Umlageverfahrens gegen die Sicherheit des Kapitaldeckungsverfahrens in das Feld geführt. Nun die neuerdings dem Reichstag vorgelegte, statistisch und mathematisch belegte Denkschrift konstatirt ausdrücklich, "dass die bei der Durch-" führung des Gesetzes in den ersten 5 Jahren gemachten Erfahrungen " erwiesen haben, dass die bei dessen Erlass aufgestellten Voranschläge " trotz der zum Theil lückenhaften Rechnungsgrundlagen genügend " sicher waren und nicht überschritten worden sind." Diese Worte werden durch den Inhalt der Denkschrift voll bestätigt. Alle Versicherungsanstalten haben Überschuss an Deckungskapital, einige sogar bedeutenden. Wenn trotzdem bei 2 Versicherungsanstalten (Ostpreussen und Niederbayern) die Beiträge zur Ansammlung des erforderlichen Deckungskapitals nicht ausgereicht haben, so liegt dies nicht an der Mangelhaftigkeit der versicherungstechnischen Grundlagen sondern an ganz eigenartigen socialen, wirthschaftlichen und populationistischen Verhältnissen in den beiden Landestheilen, welche stark überwiegend landwirthschaftliche Bevölkerung haben. Die schlechte Vermögenslage der beiden genannten Anstalten hat nämlich ihren Grund in einer nicht vorhergesehenen ungünstigen *Verschiebung der Altersgruppirung* ihrer Versicherten. Die Gründe dieser Erscheinung liegen in:

1. dem Emporblühen der Industrie und des Handels und dagegen dem Rückgange der Landwirthschaft;

2. dem dadurch veranlassten Übertritt der jüngeren landwirthschaftlichen Arbeiter zur Industrie und ihre Übersiedelung nach den industriellen Landestheilen, so dass die landwirthschaftliche Bevölkerung im Durchschnitt immer älter wird;

3. der in Folge dessen früheren Invalidität der landwirthschaftlichen Arbeiter und der schnelleren Erlangung des zum Bezuge der Altersrente nothwendigen Alters.

Während sich die im Bergbau, Hüttenwesen, in der Industrie und im Bauwesen thätige Bevölkerung zwischen den beiden Berufsstatistiken von 1882 und 1895 um 3·61 % und die im Handel und Verkehr thätige

Bevölkerung um 1·50% vermehrt hat, ist die Landwirthschaft, Gärtnerei, Thierzucht, Forstwirthschaft und Fischerei treibende Bevölkerung um 6·77% zurückgegangen. Wie ungünstig die Bewegung der Altersklassen für die Provinz Ostpreussen z.B. gewesen ist, geht daraus hervor, dass in den Jahren 1886–1890 in dem Bezirk der Versicherungsanstalt Ostpreussen von den *jüngeren* Altersklassen (1869–1830) mehr Personen weg- als zugezogen sind, und zwar:

in Altersklasse	1869-1860	. .	15·9%
„ „	1859–1850	. .	7·4 „
„ „	1849–1840	. .	4·2 „
„ „	1839–1830	. .	2·0 „

Dagegen sind von den *älteren* Altersklassen (1829–1800) mehr Personen zu- als weggezogen, und zwar:

in Altersklasse	1829–1820	. .	0·4%
„ „	1819–1810	. .	0·4 „
„ „	1809–1800	. .	3·5 „

Diese Erscheinung ist bisher steigend gewesen.

Wenn man nun die aus den bisherigen Erfahrungen abgeleitete Invaliditätstafel vergleicht, dann wird man unschwer begreifen, welchen Einfluss eine derartige Verschiebung der Altersklassen innerhalb des Bezirks der Versicherungsanstalt hat. Nach jener Invaliditätstafel kommen auf je 10,000 Versicherte alljährlich:

in der Altersklasse	von 25	Jahren	.	7·6	Invaliditätsfälle,
„ „	30	„	.	13·0	„
„ „	40	„	.	30·1	„
„ „	50	„	.	77·0	„
„ „	60	„	.	260·0	„
„ „	65	„	.	461·0	„

u.s.w.

Zu diesem Ansteigen der Invaliditätswahrscheinlichkeit im Alter kommt noch, wie schon früher ausgeführt, bei den höheren Altersklassen die schnellere Erreichung des zum Bezuge der Altersrente nothwendigen Alters von 70 Jahren.

Zur Abstellung des sich bei den Versicherungsanstalten Ostpreussen und Niederbayern ergebenen Übelstandes plante der dem Reichstage im vorigen Jahre vorgelegte aber nicht zur Verabschiedung gelangte Entwurf einer Novelle zum Invaliditäts- und Altersversicherungsgesetze eine andere als die bisherige Vertheilung der Renten nach Abzug des Reichszuschusses auf die einzelnen Versicherungsanstalten. Jeder Versicherungsanstalt sowie jeder zugelassenen besonderen Kasseneinrichtung sollte ein Viertel derjenigen Belastung verbleiben, welche aus den für ihren Bezirk (von ihr) festgesetzten Renten erwächst. Die übrigen drei Viertel sollten von sämmtlichen Versicherungsanstalten und zugelassenen besonderen Kasseneinrichtungen gemeinsam getragen und auf dieselben vertheilt werden. Ob dieser künstliche Ausgleich einmal eingeführt wird, ist noch zweifelhaft; ein natürlicherer Ausgleich wäre meines Erachtens die Centralisirung der Invaliditäts- und Altersversicherung gewesen, dergestalt, dass alle Lasten gemeinsam getragen

würden und die Versicherungsanstalten etc. nur als territoriale Ausführungsbehörden fungirten. Hierdurch würden auch die jetzt oft lästigen Zuständigkeitsstreitigkeiten zwischen den einzelnen Anstalten vermieden werden.

Zum Zweck der Erhebung der Beiträge werden von den Versicherungsanstalten *Marken* mit der Bezeichnung ihres Werthes und dem Namen der betreffenden Anstalt ausgegeben. Dieselben sind bei den Postanstalten bezw. auch bei besonderen Markenverkaufsstellen käuflich zu erwerben. Die Beiträge des Arbeitgebers und der Versicherten sind von demjenigen Arbeitgeber zu entrichten, welcher den Versicherten in der Woche zuerst beschäftigt hat. Hierbei wird die Woche (Beitragswoche), unterschiedlich von der Kalenderwoche, vom Montag an gerechnet.

Die *Beitragserhebung durch Markenverwendung* ist eine der angefeindetsten Einrichtungen der Invaliditäts- und Altersversicherung; trotzdem hat sie sich bisher als die beste erwiesen. Besonders ist die bereits mehrfach in Verschlag gebrachte Aufbringung der Mittel durch *Zuschläge zur Einkommensteuer* meines Erachtens entschieden zu verwerfen. Denn hierbei würden die gering gelöhnten landwirthschaftlichen Arbeiter des Ostens, welche aber durch die Gewährung der nothwendigsten Naturalien und das billige Leben auf dem platten Lande vielfach günstiger dastehen, als die in den theuren Industriezentren lebenden höher gelöhnten industriellen Arbeiter, zum grossen Theile zu den Lasten der Versicherung, deren Nutzen sie ziehen, gar nicht beitragen, während der Beamte, der Rentier, der Gelehrte, welche gar keinen Nutzen von der Versicherung haben, die Kosten derselben tragen müssten. Dies wäre keine Versicherung mehr, sondern eine Versicherungssteuer. Ausserdem ist die Markenverwendung, wenn sie pünktlich erfolgt, im Allgemeinen—abgesehen von sehr grossen Betrieben—auch gar nicht so lästig, wie es nach den vielen Anfeindungen den Anschein hat, und jene grossen Betriebe haben durchgängig zur Durchführung der Arbeiterversicherung besondere Beamte. Übrigens liesse sich eine Erleichterung dadurch schaffen, dass neben den Marken für *Wochenbeiträge* auch grössere Marken für *Monat*, *Vierteljahr* und *Jahr* ausgegeben würden, damit die Markenverwendung für Versicherte mit nicht wöchentlicher Lohnzahlung (Dienstboten, Comptoirpersonal, Betriebsbeamte etc.) einfacher würde.

Die Entrichtung der Beiträge erfolgt durch Einkleben der Marken bei Gelegenheit der Lohnzahlung in die *Quittungskarte* des Versicherten. Eine Ausnahme hiervon findet bei den Seeleuten und bei den in besonderen Kasseneinrichtungen versicherten Personen statt. Für diese werden die Beiträge direkt zu der betreffenden Versicherungsanstalt oder besonderen Kasseneinrichtung eingezahlt, während der Versicherte einen Ausweis darüber durch das Seefahrtsbuch bezw. durch besondere Bescheinigungen erhält. Der Arbeitgeber kann die Marken durch Daraufsetzen des Verwendungsdatums entwerthen. Die Eintragung eines Urtheils über Führung oder Leistungen des Versicherten oder sonstige in dem Gesetz nicht vorgesehene Vermerke sind unzulässig und strafbar. Der Arbeitgeber erwirbt die Marken aus eigenen Mitteln und zieht demnächst bei der Lohnzahlung dem Versicherten die von diesem zu tragende Beitragshälfte ab.

Die Quittungskarte wird im allgemeinen bei der Polizeibehörde des Beschäftigungsortes oder Wohnortes des Versicherten unentgeltlich ausgestellt und ebendaselbst, wenn sie gefüllt ist, ungetauscht, bezw. wenn sie

verloren gegangen oder unbrauchbar geworden ist, erneuert. Jede Quittungskarte trägt am Kopfe den Namen derjenigen Versicherungsanstalt, in deren Bezirk der Versicherte zur Zeit der Ausstellung der ersten Quittungskarte beschäftigt war. Es müssen also alle Quittungskarten eines Versicherten, mögen sie ausgestellt sein, wo sie wollen, den Namen derselben Versicherungsanstalt tragen; an diese Anstalt werden auch alle Karten eines Versicherten nach Umtausch oder Erneuerung zur Aufbewahrung hingesandt, sodass man aus der letzten im Besitze des Versicherten befindlichen Quittungskarte den Verbleib aller früheren Karten ersehen kann. Die Quittungskarte enthält unter anderem ausser dem Namen und Nationale des Versicherten 56 (früher 52) Felder zur Aufnahme von Marken, sowie Platz zur Eintragung anrechnungsfähiger Krankheiten oder militärischer Dienstleistungen. Bei Umtausch voller Quittungskarten erhält der Versicherte zu seinem Ausweise eine Aufrechnungsbescheinigung. Wie oben ausgeführt, *kann* der Arbeitgeber die Marken durch Daraufsetzen des Verwendungsdatums entwerthen, er ist hierzu jedoch nicht verpflichtet. Nur bei der freiwilligen Versicherung ist eine Entwerthung vorgeschrieben. Eine obligatorische Entwerthung aller Marken ist aber dringend nothwendig, um eine wirksame Controle der Markenverwendung ausüben zu können. Eine derartige Controle erübrigt sich, wenn die Beitragserhebung, wie es in Süddeutschland (besonders in Sachsen) häufig eingeführt ist, durch die Krankenkassen oder besondere Stellen erfolgt. Durch die Landes-Centralbehörde oder mit Genehmigung derselben durch das Statut der Versicherungsanstalt, oder mit Genehmigung der höheren Verwaltungsbehörde durch statutarische Bestimmung des weiteren Kommunalverbandes oder einer Gemeinde kann nämlich angeordnet werden:

1. dass die Beiträge für diejenigen Versicherten, welche einer Krankenkasse angehören, durch deren Organe für Rechnung der Versicherungsanstalt von den Arbeitgebern eingezogen und die den eingezogenen Beiträgen entsprechenden Marken in die Quittungskarten der Versicherten eingeklebt und entwerthet werden;

2. dass die Beiträge für diejenigen Personen, welche keiner Krankenkasse angehören, in der gleichen Weise durch Gemeindebehörden oder sonstige Stellen eingezogen werden. In diesen Fällen können Bestimmungen über die Verpflichtung zur Anmeldung und Abmeldung der Versicherten getroffen und Zuwiderhandlungen mit Strafe bedroht werden, während sonst Verpflichtungen zur An- und Abmeldung der Versicherten nicht bestehen.

Die Versicherungsanstalten sind verpflichtet, den Krankenkassen oder den anderen mit der Einziehung der Beiträge beauftragten Stellen die erforderlichen Marken gegen Abrechnung zur Verfügung zu stellen und eine von der Landes-Centralbehörde zu bestimmende Vergütung zu gewähren. Für den vorstehenden Fall können die Krankenkassen oder besonderen Stellen auch mit der Ausstellung und dem Umtausch der Quittungskarten betraut werden.

Die Vesicherungsanstalten können mit Genehmigung des Reichs-Versicherungsamts Kontrollvorschriften erlassen, was auch überall geschehen ist. Die Kontrole, welche anfänglich nur zu Zwecken der ordnungsmässigen Markenverwendung geschehen sollte, ist dadurch erweitert worden, dass den Kontrollbeamten meist auch die periodische Kontrole der Invalidenrentenempfänger übertragen worden ist, während

die ständige Kontrole der Rentenempfänger den Vertrauensmännern obliegt. Die Arbeitgeber und Versicherten sind verpflichtet, den Kontrollbeamten jede auf das Versicherungsverhältniss bezügliche Auskunft zu ertheilen. Vielfach sind die Verwaltungsbezirke der Versicherungsanstalten in Kontrollbezirke eingetheilt, von denen jeder einem im Bezirk wohnenden Kontrollbeamten unterstellt ist.

Rückstände sowie die in die Kasse der Versicherungsanstalt fliessenden Ordnungsstrafen werden in derselben Weise, wie Gemeindeabgaben, beigetrieben. Rückstände haben im Konkursverfahren das Recht auf vorzugsweise Befriedigung.

Den Arbeitgebern ist untersagt, durch Übereinkunft oder mittels Arbeitsordnungen die Anwendung der Bestimmungen dieses Gesetzes zum Nachtheil der Versicherten auszuschliessen oder zu beschränken.

Weiblichen Personen, welche sich verheirathen, sowie den hinterbliebenen Wittwen und Waisen von verstorbenen Versicherten kann die Hälfte der für die verheirathete weibliche Person oder den Verstorbenen entrichteten Beiträge unter der Voraussetzung zurückgezahlt werden, dass die Beiträge bis zur Verheirathung oder dem Tode für mindestens 5 Beitragsjahre entrichtet worden sind. Ein besonders glücklicher Griff war die Zurückzahlung der Beiträge an verheirathete weibliche Personen nicht, denn ein grosser Theil der weiblichen Personen, besonders diejenigen in der Landwirthschaft, arbeiten nach der Verheirathung weiter und müssen demnach auch weiter versichert werden, obgleich sie durch die Zurückzahlung der vor der Verheirathung verwendeten Beiträge die frühere Anwartschaft verloren haben und erst wieder neu die Wartezeit erfüllen müssen.

Zur grösseren Sicherheit der Ansprüche der Versicherten müssen die Versicherungsanstalten einen Reservefonds bis zur Höhe eines Fünftels des Kapitalwerthes der in der ersten Beitragsperiode der Versicherungsanstalt zur Last fallenden Renten ansammeln. Ausserdem können die Versicherungsanstalten Rückversicherung nehmen, indem sie vereinbaren, die Lasten der Invaliditäts- und Altersversicherung ganz oder zum Theil gemeinsam zu tragen.

Die Versicherungsanstalt kann unter ihrem Namen Rechte erwerben und Verbindlichkeiten eingehen, wobei sie durch ihren Vorstand gerichtlich und aussergerichtlich vertreten wird. Dieser hat die Eigenschaft einer öffentlichen Behörde.

Das Vermögen der Versicherungsanstalt darf für andere als die in diesem Gesetze vorgesehenen Zwecke nicht verwendet werden. Verfügbare Gelder der Versicherungsanstalten sind wie Mündelgelder sicher verzinslich anzulegen. Mit Genehmigung des Kommunalverbandes bezw. der Centralbehörde des Bundesstaates, für welchen die Versicherungsanstalt errichtet ist, kann die Versicherungsanstalt ihr Vermögen bis zum vierten Theile in anderen zinstragenden Papieren oder in Grundstücken anlegen. Durch diese Bestimmung ist den Versicherungsanstalten die Möglichkeit geboten, eine ausgiebige Wohlfahrtspflege besonders auf socialem Gebiete auszuüben, indem sie Geld zum Bau von Arbeiterwohnungen, Krankenhäusern oder sonstigen gemeinnützigen Bauten etc. an Gemeinden und andere Corporationen verleihen, was auch durchweg geschehen ist.

Die Versicherungsanstalten sind verpflichtet, dem Reichs-Versicherungsamt in bestimmten Fristen Übersichten über ihre Geschäfts- und

Rechnungsergebnisse einzureichen. Das Rechnungsjahr ist das Kalenderjahr.

Die Versicherungsanstalten unterliegen in Befolgung des Gesetzes der Beaufsichtigung durch das Reichs-Versicherungsamt. Alle Entscheidungen des Reichs-Versicherungsamts sind endgültig, soweit im Gesetz nichts anderes bestimmt ist. Das Reichs-Versicherungsamt ist befugt, jederzeit eine Prüfung der Geschäftsführung der Versicherungsanstalten vorzunehmen. Das Reichs-Versicherungsamt kann die Vorstände der Versicherungsanstalten jederzeit zur Befolgung der gesetzlichen und statutarischen Vorschriften durch Geldstrafen anhalten. In Bundesstaaten, wo Landes-Versicherungsämter errichtet sind, übernehmen diese einen Theil der Aufsichtsbefugnisse des Reichs-Versicherungsamts.

Für den Bezirk jeder Versicherungsanstalt wird zur Wahrung der Interessen der übrigen Versicherungsanstalten und des Reichs ein Staatskommissar bestellt. Derselbe ist befugt, allen Verhandlungen der Organe der Versicherungsanstalt mit berathender Stimme und den Verhandlungen vor den Schiedsgerichten beizuwohnen, Anträge zu stellen, Rechtsmittel einzulegen und Einsicht in die Akten zu nehmen. Zu diesem Zweck ist ihm von den Verhandlungsgegenständen rechtzeitig Kenntniss zu geben. Die Thätigkeit des Staatskommissars erstreckt sich auch auf diejenigen zugelassenen besonderen Kasseneinrichtungen, welche im Bezirk des Kommissars ihren Sitz haben.

Die Verpflichtung von Gemeinden oder Armenverbänden zur Unterstützung Hülfsbedürftiger wird durch dieses Gesetz nicht berührt.

Alle zur Begründung und Abwickelung der Rechtsverhältnisse zwischen den Versicherungsanstalten einerseits und den Arbeitgebern oder Versicherten andererseits erforderlichen schiedsgerichtlichen und aussergerichtlichen Verhandlungen und Urkunden sind gebühren- und stempelfrei.

Die öffentlichen Behörden sind verpflichtet, den Ersuchen des Reichs-Versicherungsamts, der Landesversicherungsämter, anderer öffentlicher Behörden, der Schiedsgerichte, sowie der Vorstände und Organe der Versicherungsanstalten und zugelassenen besonderen Kasseneinrichtungen, soweit sie im Vollzuge dieses Gesetzes an sie ergehen, zu entsprechen. Die gleiche Verpflichtung liegt den Versicherungsanstalten, den zugelassenen besonderen Kasseneinrichtungen, den Berufsgenossenschaften und den Krankenkassen unter einander ob.

Zuwiderhandlungen gegen die Vorschriften des Invaliditäts- und Altersversicherungsgesetzes sind unter Strafe gestellt. Die Strafen werden entweder in Form von Ordnungsstrafen seitens der Anstaltsvorstände und unteren Verwaltungsbehörden oder in Form gerichtlicher Strafen seitens der ordentlichen Strafgerichte verhängt.

Wie die gesammte Arbeiterversicherung überhaupt, so hat auch im Besonderen die Invaliditäts- und Altersversicherung viel in sanitärer Beziehung gewirkt, indem sie mit diesen Bestrebungen zugleich eine zweckmässige Vermögensanlage verband. Nicht nur, dass die Versicherungsanstalten zum Bau von Arbeiterwohnungen etc. Geld verliehen haben und dadurch auf die Wohnungshygiene nach und nach Einwirkung erlangen; nein, die Versicherungsanstalten haben auch selbst die Initiative ergriffen und durch Einrichtung und Subven-

tionirung von Lungenheilstätten Hervorragendes geleistet; und wo sie dies nicht gethan, haben sie wenigstens geeignete Kranke in Lungenheilstätten überführt, um ihnen eine Heilung oder doch wenigstens Besserung ihres Leidens zu Theil werden zu lassen. So haben die Versicherungsanstalten und zugelassenen besonderen Kasseneinrichtungen im Jahre 1897 nicht weniger als 4,480 lungenkranken Personen eine besondere Fürsorge angedeihen lassen und dafür eine Summe von mehr als 1 Million Mark verwendet. Obenan stehen hierbei die Versicherungsanstalten Hansestädte mit 616, Hannover mit 400, Königreich Sachsen mit 350, Hessen-Nassau mit 280, Thüringen mit 215 und Braunschweig mit 150 lungenkranken Pfleglingen.

Ein Hülfsmittel, um die Kranken von vornherein sachgemäss zu behandeln, ist den Versicherungsanstalten insofern durch das Gesetz gegeben, als dieselben befugt sind, bei Krankheiten, als deren Folge Erwerbsunfähigkeit zu besorgen ist, welche ein Anspruch auf Invalidenrente begründet, das Heilverfahren in dem Umfange, wie er zu einer rationellen Heilung der Krankheit geboten erscheint, selbst zu übernehmen oder durch die betreffenden Krankenkassen übernehmen zu lassen.

So ist die gesammte deutsche Arbeiterversicherung mit ihren Ausführungs-Organen (Krankenkassen, Berufsgenossenschaften, Versicherungsanstalten) fortlaufend bemüht, die Lage der Arbeiter in socialer und sanitärer Beziehung zu bessern, zum Heile des inneren Friedens und der Wohlfahrt des Deutschen Reiches, sowie zur Ehre des Begründers der deutschen Arbeiterversicherung, des Hochseligen Kaisers Wilhelm I.

TRANSLATION.

The Development and Operation of Workmen's Assurance in Germany.
By HEINRICH UNGER, *Actuary, Neu-Weissensee, near Berlin.*

A. GENERAL CONSIDERATIONS.

WORKMEN'S insurance proper is not, in Germany, a product of recent times, as many believe. For about a century there have been in existence well-organized funds which undertake the insurance of workmen, and have prepared the ground for the legislative introduction of workmen's insurance, as, for instance, the trade assistance funds (guild funds, &c.), and miners' funds, among older institutions, and the funds of the German trade unions—"Hirsch-Duncker" in particular—among more recent institutions. The beginnings of the older funds are traced back far into the last, and even to the 17th, century.

But it was left to quite modern times to create the gigantic work represented to-day by German workmen's insurance. It is true that by the Trade Ordinance, and certain other legislative enactments, a kind of compulsory insurance in the trade assistance funds, guild funds, miners' funds, had been instituted for a portion of the workmen. It is further true that, owing to the Liability Act of the 7th June 1871 (a law relating to the liability to provide compensation for deaths and accidents occurring in connection with railways, mines, &c.), a large number of employers, especially the larger ones, insured their workmen in private insurance companies against liability, or against liability and accident of all descriptions combined (collective assurance). How little, however, this partially voluntary insurance became common is shown by the following figures. In the year 1880 (*i.e., before* the coming into force of the law relating to sickness insurance of the 15th June 1883) there were assured in Prussia 1,300,000 persons; in the year 1885 (*i.e.,* immediately *after* the coming into force of this law) there were assured against sickness 2,200,000 persons, or an increase of 900,000 assured; and in the year 1893 (*i.e., after* the coming into force of the appendix to the law relating to sickness assurance of the 10th April 1892), the number of assured amounted in round figures to 3,700,000. Further, assurance against sickness has become the most favoured and customary form of workmen's assurance. For these reasons I hold that compulsion is absolutely necessary in connection with workmen's

assurance. Absolute liberty of assurance is certainly most desirable from an ideal point of view, but it is also, as all ideals, only practicable in a limited sense. Its impracticability has been eminently demonstrated in connection with workmen's assurance. Voluntary workmen's assurance will always, as shown by the above figures, signally fail, owing to the carelessness and short-sightedness of the interested parties. Experience has demonstrated this even in Switzerland, where the workmen are specially predisposed to, and prepared for, social self-help.

The German Imperial Government have also gradually arrived at this conviction. It was recognized that the workmen's condition, just as all other social conditions, had changed in the course of time, that the relations of dependence between employer and employed were no longer influenced by the patriarchal spirit, as was probably the case 50 years ago, before, by means of liberty of trade, liberty of combination, emigration, as well as by the influences of competition upon the markets of the world, and the agitations of social democracy, and finally by the growth of manufactories and the corresponding decline of small traders, the relations of the workmen to their masters had become personally freer, but also colder, and lacking the sense of joint interest. Owing to this, the feeling of the employer, that he had accepted up to a certain point a moral responsibility of protection towards the workman, whose power of work he had made use of, in case of old age, sickness, and accident, tended more and more to disappear, without any other factor taking its place. It should be remembered that public assistance of the poor always constitutes in itself something undignified, and limits the individuality of the workman, inasmuch as it deprives him of a share of his political rights. Besides, it does not serve to the maintenance of the economical, but only of the individual existence. This helplessness of the working classes in cases of need was, however, of decisive importance from a social-political point of view. Public opinion, and the community at large, disturbed, if not endangered through the discontented workmen, were compelled to take up some position with regard to these social anomalies. In place of the helplessness of the individual, the State (the community) came forward as the representative of the requirements of civilisation. The Imperial Chancellor for the time being, Prince Bismarck, defined briefly, at the meeting of the Imperial Parliament of the 9th May 1884, the claims of the workmen against the community as follows:—"Give to the workman the right to work, as long as he is in good health; secure to him assistance when ill, and secure to him maintenance when old."

Thereupon the Imperial Government took the initiative and submitted to the Imperial Parliament, first in 1881, the Bill relating to Workman's Accident Insurance, which opened the series of Laws relating to social political matters. In view of the high importance of the step, it followed that the monarch himself, the late Emperor William I, should express his views on the subject, and this he did in the following beautiful terms when opening Parliament on the 17th November 1881—

"In February last, we already allowed our conviction to be expressed that the cure of the social ills is not to be sought exclusively by means of repressing social democratic excesses, but by promoting simultaneously the positive happiness of the working classes. We consider it to be our imperial duty to impress this obligation again

upon the Imperial Parliament, and we would look back with all the greater satisfaction upon all the successes with which God has visibly blessed our Rule, if we could carry away with us, one day, the consciousness of having left to the Fatherland new and durable guarantees of internal peace, and to the afflicted greater security and fertility in the assistance to which they are entitled. In our exertions to that end we feel sure of the concurrence of all the Federal Governments, and rely upon the assistance of the Imperial Parliament without distinction of parties.

"In this sense a revision of the Bill relating to the Insurance of Workmen against accident which was submitted by the Federal Governments at the last session is now taking place, bearing in mind the deliberations which occurred thereanent in the Imperial Parliament, with the view of preparing for its renewed consideration. To complete the measure, it will be accompanied by a Bill intended to provide a similar organization to the Trade Sickness Funds. But those also who, through age and infirmity, become unable to work, have a well-established claim upon the community to a larger measure of State protection than they have received so far.

"To find the best ways and means for this protection is a difficult task, but also one of the most important requirements of every community based upon the ethical foundations of Christian National Life. The close junction to the real forces of this national life and the combination of the latter by means of co-operative associations under State protection and State care will also, we hope, enable us to solve the problems in respect of which the Government alone would not, in the same degree, be strong enough. In any case, even in this manner, the aim will not be attainable without the employment of suitable means."

The present Emperor, William II, who is imbued with the same friendliness towards the workmen as was his late Grandfather, has consequently assumed the latter's heritage also in this direction, inasmuch as, at the opening of the Imperial Parliament on the 25th of June 1888, at the commencement of his reign, he declared—

"I have summoned you, Honourable Gentlemen, in order to declare before you to the German people that I am resolved, as Emperor and King, to follow the same paths upon which my late Grandfather won the confidence of his allies, the love of the German people, and the benevolent recognition of foreigners. It rests with God whether I shall attain the same end, but I will strive towards its attainment by means of earnest work.

"Pursuant to the constitution, I have to co-operate in Imperial legislation more in my capacity as King of Prussia than as German Emperor, but in both it shall be my endeavour to continue the work of Imperial legislation in the same spirit as that in which it was begun by my late Grandfather. Especially do I make his message of the 17th November 1881 my own to its full extent, and I shall continue to act in its spirit, in order that the Imperial legislation, on behalf of the working population, may still further assure them the protection which, as a consequence of the principles of Christian ethics, it should afford to the weak and afflicted in the struggle for life. I hope it may be possible, by these means, to succeed in smoothing down unhealthy social oppositions, and I live in the expectation that, in

fostering our internal happiness, I shall find the unanimous assistance of all loyal supporters of the Empire and the Federal Governments without distinction of parties.

"I likewise consider it imperative to keep our political and social development in the lines of legality, and firmly to resist all attempts having for object and effect to undermine the order of the State."

In these two messages from the Throne, the foundation of Workmen's Assurance, the magna charta of the whole recent social politics of the German Empire, is in a sense contained. Up to the present the following laws have been enacted in chronological order:—

Sickness Assurance.

Assistance Fund Law of the 7 April 1876. 1 June 1884.

Sickness Assurance Law of 15 June 1883. 10 April 1892.

Accident Assurance.

Accident Assurance Law of the 6th July 1884;

Law relating to the extension of Accident and Sickness Assurance of the 28th of May 1885;

Law relating to Accident and Sickness Assurance of persons engaged in agricultural and forestry pursuits of the 5th May 1886;

Law relating to Accident Assurance of persons engaged in the building trade of the 11th July 1887;

Law relating to Accident Assurance of seamen and others engaged in seafaring pursuits of the 13th July 1887;

Law relating to the maintenance of public officials, and persons of the military profession, in consequence of accidents during service of the 15th March 1886.

Infirmity and Old Age Assurance.

Law relating to Infirmity and Old Age Assurance of the 22nd June 1889.

At present there are subjected to these laws about 18,000,000 to 19,000,000 assured persons of both sexes and of every age, from the child to the old man, so that, seeing that the population of the German Empire, according to the census of 1885, amounts to about 52,000,000 persons, more than one-third of the whole population, or more than two-thirds of the wage-earning population, which, pursuant to the trade census of 1895, amounted to about 24,253,000 persons, are subject to workman's assurance.

With regard to the utility of workman's assurance in general, the compensation which it offers in respect of the excrescences of migration cannot be considered slight, through the fact that a portion of the old and infirm workmen, after obtaining the annuity, mostly settle in cheaper localities (the old home, &c.). Hence, if the workman who, to a certain extent, immigrated from the country to industrial localities be exhausted, he may again retire with his annuity to the country, and in this way be no longer a charge to the larger locality, while, in the small country place, the small provincial town, where cash is of greater value, the annuity will in any case secure to the workman a modest living, and be, in the household of a relative, of

comparatively great value, especially if the annuitant can still make himself useful by rendering small services (looking after the children, feeding of cattle, &c.), and thereby may enable the relative to find work outside.

This relief of great localities from exhausted forces also serves, as was admitted from the outset, to relieve Poor Unions, seeing that a large number of recipients of sickness money and annuities would otherwise fall to the charge of Public Poor assistance. It is true that this favourable result for the Poor Unions has not yet been much felt, owing to the workman's assurance and, particularly, the infirmity and old age assurance having been relatively but too short a time in existence, and owing to the appendix to the Law of Domiciliary Assistance of the 12th March 1894, by which an increase of the Poor charges has partly taken place, but the favourable influence of workman's assurance upon Poor assistance is noticeable and that suffices for the present. For instance, there were in Berlin until 1893, out of about 1,600 annuitants, 150 receiving Poor relief. Of these, 42 persons receiving 5,800 marks in alms in addition to 5,780 marks as annuities remained under Poor relief, 25 persons receiving 2,820 marks in alms left altogether, and 83 partially: *i.e.*, from 14,000 marks, in alms, to 8,600 marks, hence with a reduction of 5,400 marks. This indicates a saving, caused through workman's assurance, of about 8,000 marks annually, although for humanitarian reasons the Poor relief formerly granted was withdrawn altogether from relatively but very few annuitants. How large the saving actually was, or is, is not clearly established, as the observation did not include all annuitants. Six annuitants receiving 636 marks in alms besides 1,060 marks in annuities became a charge to Poor relief after the commencement of the annuities. A similar result has been established by the investigation instituted in 1891 by the "German Society for Poor Assistance and Benevolence." This society made enquiries of 378 Poor administrations, of which 110 replied, amongst which were 44 large, 31 medium, and 18 small ones, and a further 17 country communes situated in all parts of Germany. By far the largest number of all these localities affirmed a diminution, often of considerable extent, of the Poor charges through the social assurance; only a few have denied such diminution or left the question open. The smaller country communes, which by the way, have only trifling Poor charges, have naturally experienced less this effect of the social assurance. Some places, it is true, are of opinion that the increased measure of care which, through the workman's assurance legislation, has been bestowed upon the working classes, has not and cannot remain without influence upon the habits of the masses of the population, and that this influence is also felt in connection with Poor relief. But this influence should be welcome from a social, ethical, and hygienic point of view, as it involves an improvement of the social, ethical, and hygienic conditions. The hospital conditions especially, which in many instances were deplorable, are improved by the workman's assurance, as is pointed out by a great number of the localities applied to.

That workman's assurance, while granting some security to the workman in cases of need, has not acted anti-economically, as is alleged by some adversaries, is proved by its influence upon the savings

bank conditions. The workmen have, not more than formerly, allowed themselves to be induced to abstain from saving by the prospect of sickness moneys, annuities, &c.; on the contrary, the saving conditions have been improved, as is shown by the following table. In Prussia there were :—

In the Year	With a Population of	Savings Bank Books	Total Deposit Marks	This gives	
				One Savings Bank Book per . . . Inhabitants	For every Inhabitant a saving of Marks
1870	24,689,000	1,392,000	495,650,000	18	20
1875	25,742,000	2,209,000	1,112,080,000	12	43
1880	27,279,000	2,942,000	1,594,620,000	9	58
1885	28,318,000	4,209,000	2,260,930,000	7	80
1890	29,958,000	5,593,000	3,281,571,000	5	110
1894	31,848,000	6,527,000	4,000,460,000	5	126

Of these savings bank books and saving deposits not a small share belongs to the workmen and other people of the so-called lower classes (small master craftsmen, small tradesmen), who are mostly subject to workman's assurance. Of 6,491,573 savings bank books of the year 1894, the deposit amount of which could be ascertained, 29·16 per-cent referred to books up to 60 marks, 16·04 per-cent to those above 60 marks up to 150 marks, 12 per-cent to those above 150 marks up to 300 marks, 15·42 per-cent to those above 300 marks up to 600 marks, and finally 25·26 per-cent to those above 600 marks. The reason for this expansion of saving is, no doubt, to be found in the fact that the money saved, together with the expected annuity, secures to the workman, to some extent, an old age free of anxiety, whereas formerly the small savings alone could not be of much avail.

Of what utility, expressed in figures, workmen's assurance is to workmen, may be gathered from statistics embracing the years 1885 to 1896, namely, that during this period there were paid altogether 1,243,763,965 marks in the shape of sickness moneys and continuous annuities. The employers paid in contributions 969,742,016 marks, the workmen 887,865,084 marks; hence the workmen received 355,898,881 marks more than the amount contributed by them. It is true that, so far, the carrying out of German workmen's assurance has not been possible without great sacrifices on the part of the employers; but it cannot be denied that the latter incur a certain moral responsibility to look after the welfare of the workmen exhausted by them. Besides, the aim of workman's assurance is to render the workman as far as possible independent of the economical situation and personal care of his employer, to give him the consciousness of his own strength, and in this way to educate him to economy, to enable him by reasonable providence to live and secure a living for his family in case of need, and to look forward to an old age free of anxiety, and finally to render him through all this more satisfied, a duty well worthy of special efforts towards its fulfilment by those most interested in industry, agriculture, and commerce.

So far, German workman's assurance has been treated in its

general aspect; its individual forms will be considered in the following chapters.

B. Sickness Assurance.

Sickness assurance is, in Germany, the oldest organized form of individual assurance; its beginnings date back several centuries. There are, particularly, two kinds of organizations out of which the industrial sickness funds have been developed, namely, the Guild Funds and the Journeymen's Funds (later industrial assistance funds).

The oldest institutions are the Guild Funds, formerly called likewise Rifle Funds, to which the miners had to pay the so-called rifle pennies. Mention of them is made in the Kuttenberg Mining Ordinance so far back as the year 1300, and in the Cologne Mining Ordinance of the year 1669. They were specially promoted through the Cleve-Märkische Mining Ordinance of the year 1766, and through the revised Mining Ordinance for the Duchy of Silesia and the County of Glatz of 1769. To-day the organization of the Guild Unions and of the Guild Funds is based upon the General Mining Law of the 24th June 1865 in the form described in the appendix of the 24th June 1892.

The Journeymen's Funds of the corporations are almost as old as the corporations themselves, but only comparatively lately did they receive such a distinct organization as the Guild Funds, without, however, ever attaining the importance of the latter. As the corporations, after the introduction of liberty of trade, more and more declined, a legal basis was given to the old Journeymen's Funds in order to protect them against extinction, and this was done in Prussia first by means of the General Trade Ordinance of the 17th January 1845, the Ordinance of the 9th February 1849, and the law of the 3rd April 1854. These regulations were, later on, embodied in the Trade Ordinance for the North German Confederation of the 21st June 1869, and have been modified only by the recent workmen's assurance.

Both institutions—Guild Funds and Industrial Assistance Funds —were based more or less upon compulsion, as was not otherwise possible in view of the structure of the organizations—(Guilds, Corporations) upon which they rested.

Whereas now the Guild Funds, in view of the almost exclusively large dimensions of the mining establishments and the greater concentration of the workmen connected therewith, have flourished increasingly, and even to-day, in respect of the mining industry, replace partly the legislative workman's assurance; the Industrial Assistance Funds (Journeymen's Funds) existed only in large localities, especially industrial districts, where corporations still existed, or a greater number of workmen of the same trade were present; apart from this they led a rather insignificant existence. In 1876 they experienced an increase. Whereas, the Imperial law of the 7th April 1876, respecting the registered assistance funds specially regulated the constitution and administration of registered assistance funds, which aim at rendering mutual assistance to members in case of sickness, the new tenor of the Trade Ordinance which was brought about by the Imperial Law of the 8th April 1876 in connection with the modification of Art. VIII of the Trade Ordinance, granted to the local communes and eventually

to the larger municipal unions the right to inaugurate on the one hand by Act the formation of registered assistance funds for the support of journeymen, employés, factory workers, etc., and to regulate their constitution; on the other hand, also to impose upon intending members, having reached the age of sixteen, the obligation to join such official fund, if they did not prove their membership in any other registered assistance fund. The law regulated at the same time the duty of notification and contribution by the employers.

The funds established on the basis of the law relating to assistance funds, served exclusively to the assurance against sickness and burial. They were also mainly constituted for workmen, although other funds and professions could take, and indeed have taken, advantage of the benefits of the law. The most important and extensive registered assistance funds are the Sickness and Burial Funds of the Hirsch-Duncker Industrial Unions and the so-called Central Funds constituted upon social-democratic principles. The Hirsch-Duncker trade unions, in particular, are distributed over the whole of Germany by means of local branches, and the oldest trade union of the German engine-builders and metal-workers, established in 1869, was already represented in 1894 by branches in more than 400 localities. An idea of the extensive growth of this organization is obtained by a glance at its statistics. All the Hirsch-Duncker trade unions comprised, in 1880, only 530 local branches (local unions) numbering, in round figures, 21,000 members, whereas, in 1894, the local unions amounted to 1,200, with 67,000 members. But the social democratic central funds are also very extensive. For instance, the General Sickness and Burial Fund of Metal-workers (registered Assistance Fund 29 Hamburg) possessed, in 1889, already more than 400 local branches, with about 33,000 members. This considerable growth of the registered assistance funds, especially of the two aforesaid groups of them, is mainly due to the fact that their members, by means of guaranteeing fixed minima allowances by the funds, were exonerated from compulsorily joining some obligatory fund. To that end the assistance funds obtained, in accordance with s. 75 of the Law relating to Sickness Assurance of the 15th June 1883, a certificate exempting their members from the obligatory or compulsory funds. At the same time, an appendix to the Assistance Funds Law of the 7th April 1876 was issued under date 1st June 1884, adapting the law more fully to the latest provisions of the Sickness Insurance Law. The assistance funds received a still more material and disturbing modification by the appendix to the Sickness Assurance Law of the 10th April 1892. Whereas formerly a free assistance fund was not obliged to provide assistance in kind (free doctor, medicine, spectacles, trusses, &c.), but could replace these by an enhanced fee to be allowed to the patient; and further, whereas the amount of the minimum allowance by the fund was also regulated in accordance with the conditions and circumstances of the community in the district where the fund was established, now the circumstances of the community, where the person assured is employed, apply. Besides, the registered assistance funds must also now, in order to free their members from the obligation of being assured in the compulsory funds, grant the above allowances in kind. It is not difficult to obtain an idea of the enhanced charge which accrues to a fund comprising

more than 400 administrative branches, from the fact that the grants, in almost every administrative branch, and even within each one of them, must be calculated differently, according to the locality where the assured is occupied, because the local wages fixed by the authorities as applicable to each individual locality vary very much. The other circumstances of the assistance funds will be dwelt upon in connection with the following description of the Sickness Assurance Law.

Under the Sickness Assurance Law of the 15th June 1883, pursuant to the provisions of the appendix of the 10th of April 1892, there are now brought about 8,000,000 persons who are assured in about 22,000 funds. Pursuant to the Sickness Fund Statistics for 1895, the same are divided as follows:—

Description	Number	Number of Members
Of the Funds		
Communal Sickness Assurances	8,449	1,287,650
Local Sickness Funds	4,475	3,450,599
Factory Sickness Funds	6,770	1,913,917
Building Sickness Funds ...	102	26,566
Corporations' Sickness Funds	545	114,581
*Guilds' Sickness Funds ...	225	484,841
Registered Assistance Funds .	1,388	671,668
National Assistance Funds ...	263	60,543
Total	22,217	8,010,365

* The Guild Funds are not included in the Official Imperial Statistics, and the above figures are based upon private sources of information.

The above figures are only relatively correct, inasmuch as on the one hand the number of funds in the course of the year fluctuates, owing to the dissolution of old and the creation of new ones, and as on the other hand various persons are also assured in two funds.

The following are subject to compulsory assurance, namely:—

All non-independent persons who are employed by means of salary or wages (grants in kind are included herein) in—

1. Mines, salt works, engineering works, quarries, factories and foundries, on railways, inland shipping and dredging service, dockyards, and the building trade;
2. Mercantile trades, handicrafts and other active industrial pursuits, excepting employés and apprentices in chemists' shops;
3. In the business of solicitors, notaries, and executive officers of the law, of sickness funds, trade associations, and insurance companies;
4. Industries in which steam-boilers or motors driven by elementary power (wind, water, steam, gas, hot air, &c.) are in use, in so far as such use does not consist exclusively in the temporary use of a power engine not belonging to the establishment.

5. The Postal and Telegraph Services

in so far as the occupation through its nature or in advance is not limited, by arrangement, to a term of less than a week. The commercial employés, also, are subject only to compulsory insurance, if by contract the rights pertaining to them in case of illness, pursuant to the commercial code, have been abolished or curtailed.

By statutory regulation of a commune, or some large municipal union in respect of its administrative district, compulsory assurance may be extended to—

1. The aforesaid persons whose occupation, through its nature is limited, or has been limited in advance by arrangement, to a term of less than a week;
2. Persons engaged in municipal works or municipal service, who are not "ex lege" subject to compulsory assurance;
3. The members of the family of an undertaker of works whose occupation in the works is not carried on pursuant to some contract;
4. Independent manufacturers who are engaged by agreement and on account of other manufacturers in manufacturing or manipulating trade products in their own works (home industry); and this, also, in the case of their supplying themselves the raw and auxiliary materials, and, for the time, also, during which they work temporarily on their own account;
5. Commercial employés and apprentices, in so far as they are not "ex lege" subject to compulsory assurance;
6. The workmen and officials engaged in agriculture and forestry.

By decree of the Imperial Chancellor, or of the Central State authorities (Ministries) the obligation to assure may also be extended to such persons who are employed in Imperial works or service or in the service of a Federal State, and who are not *ex lege* subject to compulsory assurance.

Officials, foremen and experts, commercial employés, and apprentices who are engaged in the businesses of solicitors, notaries, and executive officers of the law, of sickness funds, trade associations, and insurance companies, as well as the persons employed in works or the service of the Empire, of a Federal State, or a municipality, in so far as they are officials, are subject to compulsory assurance only if their wages or salaries do not exceed $6\frac{2}{3}$ marks per diem, or if, so far as the wages or salaries are payable periodically, they do not exceed 2,000 marks annually.

Further exceptions from compulsory assurance, partly *ex lege*, partly upon proposal, are also permissible to persons who, in case of illness, possess already a legal claim against their employers as to allowance of the minimum grants provided by the Sickness Assurance Law, or who, owing to infirmities, are only able to work to a limited extent.

For domestic servants, compulsory assurance is not prescribed, in so far as they do not come under the description of agricultural workmen or trade employés. Domestic servants may, however,

voluntarily join the municipal sickness assurance (not the organized sickness funds).

Assurance, with its legal consequences, commences, as a matter of course, from the moment of admission to an occupation which is subject to compulsory assurance. The notice of admittance and withdrawal, as well as the payment of the contributions prescribed by law are only consequences of the effected assurance. The sickness funds are, therefore, obliged to assist a workman in case of illness, even although he may not have been notified by the employer, through carelessness, and for whom, consequently, no contributions have been paid, but they can seek redress against the employer.

With a view of carrying out sickness assurance, compulsory assurance is ordained, but not compulsory adhesion to a fund. Only in a very limited degree may the latter be found therein, that not every fund is proper to fulfil the duty of assurance, but that such funds must correspond rather to definite regulations. In the front rank are to act as vehicles of assurance :—

The local sickness funds;
The industrial (factory) sickness funds; and
The builders' sickness funds.

These are, as in accident assurance, the professional corporations, and in infirmity and old age assurance, the assurance companies destined to carry on the business of sickness assurance. When in any locality or district such an organized fund does not exist, and its establishment is impracticable, the municipal sickness assurance is to take its place. While in Northern Germany the latter has remained what it should be, namely, a makeshift, and is represented only in a sporadic way, municipal assurance has assumed very great extension in Southern Germany. The reason is to be found in the fact that already prior to the issue of the social-political Imperial laws, sickness assistance by the municipality against contributions was developed in Southern Germany. The Bavarian law of the 29th April 1869, relating to public assistance to the poor and the sick, served as a model of this legislation, to which were added later the Baden Poor Law of the 5th May 1870 and the Wurthembergian Law of the 23rd April 1873, for carrying out Imperial Law relating to residential assistance. In introducing to a large extent, sickness assurance, instead of the local sickness funds, municipal and others, the South German localities only continued an old custom or an ancient institution. Whether this has contributed to render workmen's assurance more palatable or popular to the interested parties I would, however, strongly doubt. In municipal sickness assurance there is no organized fund, but the community itself bears the risk of the assurance. The commune must therefore also bear the risk which may accrue through an erroneous calculation of the mutual obligations or through an excessive frequency of sickness. Municipal sickness assurance will, therefore, always smack of public Poor relief. Through municipal sickness assurance, sickness assurance loses much of its character as assurance. In addition to the aforesaid organized funds and municipal sickness assurance, the Corporation's Sickness Funds and the Guild Funds have been admitted out of historical and political considerations, in order not to weaken the ancient Corporations and Guilds, which are important institutions in a politico-economical sense, but to lend them

through the new social-political laws, new force to their beneficent activity.

The members of registered funds established on the basis of the law of $\frac{7 \text{ April } 1876}{1 \text{ June } 1884}$, and of the Assistance Funds established on the basis of legal regulations are exonerated from the obligation to belong to the municipal sickness assurance, or to any sickness fund (to this class the Guild Funds do not belong), established in accordance with the sickness law, provided these funds, in case of sickness, make at least the same allowances as are to be granted according to law by the commune in whose district the obligatory assured is employed. While municipal sickness assurance and the aforesaid organized funds involve a certain compulsion to join, such a compulsion to join the registered and the legal Assistance Funds can no longer be prescribed pursuant to recent legislation. The employers, especially, are not allowed to carry out such compulsion through the labour contract or otherwise; they are indeed prohibited from cancelling or limiting the application of the provisions of the Sickness Assurance Law to the detriment of the assured by means of contracts (through regulations or special arrangement).

Neither the fixing of the amount of the contributions nor the calculation of allowances are arrived at mathematically; both are, at the outset, estimated in the light of practical experience, and later on are increased or reduced according to requirements. The amount of the contributions is generally based upon the amount of the local or average daily wages. The assurance contributions to be levied by the commune, for instance, are not to exceed 1½ per-cent of the local daily wages. They may, if the annual accounts should show that they are insufficient to cover the legal sickness assistance, with the sanction of the higher administrative authorities, only be raised to 2 per-cent of the local daily wages. In connection with the Obligatory Funds the contributions are borne: two-thirds by the workmen and one-third by the employers; in the Voluntary Funds the workmen bear the contributions alone.

The minimum allowance granted by the Municipal Sickness Assurance consists of—

1. Gratuitous medical attendance, medicine, as well as spectacles, trusses, and similar appliances;
2. In case of disability, from the third day after the day on which the sickness commenced, a sickness allowance in money amounting to one-half of the local daily wages of an ordinary journeyman.

In lieu of gratuitous medical attendance, medicine and sickness money, gratuitous nursing at some institution may be allowed, and one-half of the sickness money devoted to dependent relatives.

The minimum allowance cannot be granted beyond 13 weeks. A similar minimum allowance is prescribed in connection with the registered and legal Assistance Funds.

The other funds have, in addition to this minimum allowance, to grant as legally prescribed sickness assistance:

3. Assistance to a woman lying-in during four weeks at least after confinement;
4. In case of death, burial money amounting to 20 times the average daily wages;

Besides, the sickness money under No. 2 is calculated according to the average daily wages.

An increase and extension of the allowances of the local Sickness Funds is permissible as follows:

1. The sickness allowance can be increased and fixed for a longer term than 13 weeks;
2. After conclusion of the sickness assistance, provision for convalescents, especially also admission to a Home for convalescents, may be allowed;
3. The lying-in assistance may be extended;
4. The burial money may be increased;
5. Free medical assistance, free medicine and other curative remedies, as well as lying-in assistance may be allowed to sick relatives of Fund members, in so far as the same are not themselves in the position of obligatory assured;
6. At the death of the wife or a child of a Fund member, burial money may be allowed, in so far as such persons do not find themselves in a position connected with legal assurance, and hence entitling their survivors to claim burial money.

The said funds may not extend their allowances to any other assistance, especially to assistance of invalids, widows, and orphans.

A term of respite may, generally, only be introduced in respect of voluntary members; as regards obligatory members at most only respecting fund contributions in excess of the legal minimum amounts.

With regard to the allowances of the Sickness Fund, it may be interesting to consider more closely some of the relative figures.

In the year 1895 each member of the Sickness Funds experienced on an average:

In the (1)	Cases of Sickness (2)	Days of Sickness (3)	Sickness Expenses Marks (4)
Municipal Sickness Assurances ...	0·3	4·4	7·99
Local Sickness Funds	0·4	6·4	13·22
Industrial (Factory) Sickness Funds	0·4	6·8	18·51
Builders' Sickness Funds	0·5	9·8	23·87
Corporation Sickness Funds ...	0·3	5·2	11·62
Registered Assistance Funds ...	0·4	6·7	15·80
Legal Assistance Funds	0·3	6·5	15·27
Sickness Funds generally	0·4	6·2	13·93

In the sickness expenses are included medical fees, drugs, and other medicaments, sickness moneys, assistance to women lying-in, burial moneys, and expenses at Homes for Patients.

The average results of the years 1885 to 1895 are as follows:

To any one Assured Apply Annually Marks					To One Case of Sickness Apply		To 100 Assured Apply			Of 100 Marks Sickness Expenses Apply to					
Contributions of		Expenses for			Sickness		Patients								
Employers (1)	Employed (2)	Illness (3)	Administration (4)	Funds (5)	Days (6)	Expenses Marks (7)	Male (8)	Female (9)	Generally (10)	Sickness Money (11)	Doctor (12)	Medicaments (13)	Expenses at Homes (Institutions) (14)	Burial Money (15)	Confinements (16)
3·96	10·19	12·61	0·85	10·89	16·4	34·98	37·1	31·9	36·0	46·56	20·45	16·61	10·97	4·00	1·41

To the statistics recorded in this Paper, the works of the Imperial Assurance Department, of the Imperial Statistical Department, of the Imperial Health Department, and of the Royal Prussian Statistical Bureau, have served as basis.

The expenses of administration in connection with Sickness Assurance amount to about 5 per-cent of the total receipts. In accordance with the principle of self-administration, every fund bears its own costs of administration; only in connection with Municipal Sickness Assurance are they chargeable to the commune, and in connection with the Industrial and Builders' Sickness Funds to the undertaking agent.

To secure the regular execution of the obligations incumbent upon the Sickness Funds, the Municipal Sickness Assurance, the Local Sickness Funds, and Guilds' Sickness Funds, have to set aside a Reserve Fund amounting to the average annual expenditure of the last three years, the Registered Assistance Funds, such a fund amounting to the average annual expenditure of the last five years. Originally, no Reserve Fund was prescribed for the Registered Assistance Funds, but they were obliged instead to have the probable amount of their liabilities, and of the corresponding income, valued every five years by a professional expert actuary not connected with the administration of the fund. To my mind, no loss can accrue to the Fund members from this discontinuance of professional examinations, inasmuch as they have obtained a new guarantee through the Reserve Fund. The quinquennial average valuation of the same will likewise be sufficient, inasmuch as in the case of large funds extending over provinces, the entire State, even throughout the Imperial Dominions, a constant balance is established through the fluctuation of the working population, whereas in the case of small funds, the state of affairs can easily be ascertained. It would be desirable, in any case, if such professional assurance examination, which might be undertaken every five years, were prescribed for all Sickness Funds (Obligatory and Voluntary Funds), in order also that exact statistics and, simultaneously, the preparation of reliable tables of sickness might be rendered possible. Finally, the funds have to submit annually to the supervising authorities a balance-sheet as well as statements relating to the members, cases of sickness and deaths, the contributions collected and grants allowed, in order that the supervising authorities may by their means verify the solvency of the funds.

The organs of administration of the fund are the General Court and the Board of Direction appointed by the same, the Board representing the fund judicially, and extra-judicially, and conducting its current business as laid down by the statutes of the fund. All funds excepting Municipal Sickness Assurance, which does not represent a real Sickness Fund, possess the character of a judicial personality. As a matter of fact, the administration of the funds is carried on by their members (self-administration), *i.e.*, by the workers, but the employers, who are obliged to make contributions to the funds, are nevertheless entitled to be represented on the Board and at the General Court.

All or several Municipal Sickness Assurances and Local Sickness Funds existing within the district of a supervising authority, may combine to form a Union in order—

1. To appoint a common accountant and cashier and other common officials (sickness inspectors, &c.).
2. To enter into common agreements with doctors, chemists, infirmaries for patients, and purveyors of drugs and other requirements in connection with the care of the sick.
3. To the erection and administration of common institutions for the cure and boarding of sick members, as well as for the care of convalescents.
4. To defray in common the costs of sickness assistance to a share not exceeding one-half of the total amount.

A union of the kind possesses likewise the character of a judicial personality. To cover the expenses the interested funds must make advances in the course of the year, while the total expenses are apportioned at the end of the year amongst the participating funds in proportion to the contributions collected.

The legal obligations of the Poor Unions are not affected by the sickness assurance.

The individual funds must grant to each other legal assistance.

Contraventions against the prescriptions of the law are subject to penalties.

Workman's assurance, and, particularly, sickness assurance have produced an improvement in sanitary matters. In families where formerly no doctor was to be seen, the doctor is now and again applied to owing to the gratuitous nature of medical assistance and the medicaments connected therewith established by workman's assurance. In this way the doctors, and partly also the medical officials (district physicians, district surgeons, &c.) obtain an insight into the sanitary conditions of the locality, of the individual dwellings and their occupiers, and they can consequently co-operate more effectively in the improvement of the relative conditions, especially if the communities grant active help. The consequence thereof is that the state of health of the people and the social activity of the population are raised, that a fresh breeze enters municipal life, that the sickness and mortality conditions of the locality take a more favourable aspect, &c., &c.

Of considerable importance in connection with the better and more effective cure of diseases, especially of the diseases of occupations, are the convalescent homes, founded by various sickness funds or unions of sickness funds. What is the use, for instance, in connection with lead disease (chronic lead poisoning) if the colic attacks or symptoms of lameness are done away with, so that the patient may be provisionally (*i.e.* temporarily) able to work and earn his living, while the lead remains in the body, or in connection with consumption, if the catarrhal attacks, cough or blood spitting, are driven off by means of internal medicaments, while the disease itself pursues, more or less, its destructive course. The sojourn in convalescent homes, medical establishments for affections of the lungs, &c., as they have been, and are more and more, created by the institutions of social workmen's assurance, is therefore a necessary requirement in connection with a rational treatment of diseases.

C. Accident Assurance.

In the field of industrial accidents, the old regulations of the Civil Law were not sufficient, in order to make good to the injured or

his survivors the damage sustained. Either the damage was caused by personal imprudence, in which case a claim to indemnity could not be substantiated, or the accident was occasioned by a fellow workman or official, who, as a rule, was not sufficiently well off to offer any means of compensation.

These anomalies led to the promulgation of the Imperial Law of the 7 June 1871 relating to the liability to indemnity for deaths and bodily injuries occurring in connection with the exploitation of railways, mines, &c. (so-called Liability Law), and subjecting the employers to liability for compensation for accidents which occurred within his establishment under certain conditions (carelessness of his foreman, &c.), provided the accident was not caused through *force majeure* or the fault of the victim himself.

The wearisome procedure of evidence to which the injured was subject, and the heavy costs in which he was mulcted in the event of the lawsuit being decided against him, deterred, however, many from commencing proceedings. Although, in this respect, the organizations of legal protection of various industrial unions, for instance, of the trade unions "Hirsch-Duncker" had provided certain assistance, the Liability Law did not, nevertheless, satisfy the legitimate wishes of the workmen, who generally, in cases of dispute, remained powerless against the enterprising employers provided with powerful capital. The Imperial Government recognizing this evil, resolved thereupon to render the workmen independent of the private-judicial care of the employers, and to provide for them the care of public judicial assurance. To this end the Imperial Government submitted, on the 8 March 1881, to the Imperial Parliament a Bill relating to the Accident Assurance of the Workmen, a Bill which was the first of a series of social political Bills. The Bill was passed by the Imperial Parliament with various modifications, but did not receive the sanction of the Federal Council. A second Bill relating to the accident assurance of workmen, submitted to the Imperial Parliament on the 8 May 1882, was not disposed of, and did not get beyond the deliberations in committee. Only the third Bill, submitted by the Imperial Government to the Imperial Parliament on the 6 March 1884, was destined to become law.

This first Accident Assurance law, of the 6 July 1884, referred mainly to industrial trades, and is therefore called "Industrial Accident Assurance Law." The following are subject to it:—

1. All workmen and officials (the latter only if their annual income, by way of salary or wages, does not exceed 2,000 marks) engaged in mines, salt works, ore washing establishments, stone quarries, dock and building yards, as well as in factories and foundries.
2. The workmen and officials who are engaged in works other than the aforesaid, in which steam boilers or motors driven by some elementary power (wind, water, steam, gas, hot air, &c.) are in use. Excluded herefrom are the auxiliary works connected with agricultural and forestry not coming under No. 1, as well as such works in connection with which a power engine not belonging to the establishment is only temporarily used.
3. Workmen and officials engaged in the works of a

tradesman whose business extends to the execution of masonry, carpentry, plumbing, stonecutting, and well-sinking, as well as workmen engaged as chimney sweeps;

4. Workmen and officials of industrial establishments, railway and seafaring undertakings which form important sections of any one of the foregoing works.

By statutory regulation of the trade associations, compulsory assurance may be extended to officials receiving an annual salary exceeding 2,000 marks. By statute, it may further be stipulated that, and under what conditions, owners of businesses which are subject to compulsory assurance according to Nos. 1 to 4, are entitled to assure themselves or other persons who are not subject to compulsory assurance according to Nos. 1 to 4. For such trades coming under Nos. 1 to 4 which do not involve any risk of accident to the persons engaged therein, compulsory assurance may be relinquished by decision of the Federal Council.

Compulsory assurance obtained an extension through the law of the 28th May, 1885 (the so-called Expansion Law). Pursuant to the same, the Accident Assurance Law of the 6th July 1884, is applied to:

1. The whole postal, telegraphic, and railway administrations, as well as to all branches of the Navy and Army administrations, including the constructions which are being carried out by these administrations on their own account;
2. The dredging works;
3. The carriers, inland shipping, wood-floating, flatboat and ferry trades, as well as the business of ship-stowing;
4. The carrying on of the dispatching, warehousing, and cellarage business;
5. The trades of goods packers, goods loaders, stewards, sorters, weighers, measurers, quay-porters, and stowers.

By the Agricultural Accident Assurance Law of the 5th May 1886, there were subjected to assurance:

All workmen and officials engaged in agricultural and foresters' trades; the officials, however, only if their annual income in the shape of salary or allowance does not exceed 2,000 marks; also, all workmen and officials engaged in auxiliary agricultural and foresters' occupations not coming under the Accident Assurance Law of the 6th July 1884.

It is left to the State legislation to decide to what extent and under what conditions the owners of the aforesaid industries shall be assured. Compulsory assurance may also be extended by statutory regulation to officials receiving an annual salary above 2,000 marks, as well as to employers whose annual profit does not exceed 2,000 marks. The employers of aforesaid industries are entitled to assure other persons engaged upon their works who are not subject to compulsory assurance, and to assure themselves, if their annual profit does not exceed 2,000 marks. This latter right may be extended by statute to employers whose annual profit exceeds 2,000 marks.

Pursuant to the law of the 11th July 1887, relating to accident assurance of persons engaged in the building trade, the workmen who are engaged in the building trade and are not already assured by virtue of the laws above dealt with of the 6th July 1884, 28th May

1885, and 5th May 1886, are assured against accident. The same applies to the officials engaged in the building trade if their annual income in the shape of salary or allowance does not exceed 2,000 marks. By statutory regulation, compulsory assurance may be extended to officials receiving an annual salary exceeding 2,000 marks, and to tradesmen who do not employ regularly at least one salaried workman.

Undertakers of building works are entitled to assure other persons than the above engaged in connection with the building trade, who hence are not assured as a matter of course, and to assure themselves if their annual trade profit does not exceed 2,000 marks. The latter right may be extended by statute to undertakers of works whose annual trade profit exceeds 2,000 marks, and to tradesmen not employing regularly at least one salaried workman.

The law of the 13th July 1887, relating to the accident assurance of seamen and others engaged in the seafaring trade subjects to compulsory assurance all persons who—

1. Are engaged as sailors or form part of the crew, are engaged as engineers, stewards, or in any other capacity act as seamen on German ships; sailors, however, only if they receive salary or wages;
2. Are engaged on floating docks and similar establishments in connection with home works, as well as in inland works connected with the pilot service, the rescue and salvage of persons or things at shipwrecks, the watching, lighting or maintenance of the waterways used in connection with sea traffic.

Seamen are not subject to the provisions of this law if they belong to the crews of fishing boats or to the crews of such sea-going boats having a gross capacity of not more than 50 cubic meters and, besides, serving neither as auxilary to some larger ship nor being constructed to be set in motion by steam or other mechanical power.

The assurance is effected, under guarantee of the Empire, by the owners mutually, who, to that end, are formed into trade associations. The trade associations are to be founded for specified districts and embrace within these limits all the businesses of the several industrial branches in respect of which they are established. Works embracing material sections of various branches of industry are to be attached to the trade association to which the main section of the work belongs. The trade associations may, in their own name, acquire rights and contract obligations, enter into and defend suits at law. For the obligations of the trade associations the association funds alone are liable to the creditors. Trade associations which are unable to fulfil the obligations required by law, may be dissolved by the Federal Council at the request of the Imperial Assurance Department. The branches of industry which constituted the dissolved association are to be amalgamated with other trade associations according to their nature. At the dissolution, the legal claims and obligations of the association are transferred to the Empire or, in individual cases, to the Federal State in respect of whose territory the dissolved association was established.

There exists a difference between the administration of industrial and agricultural trade associations, in so far as the industrial trade associations manage their own affairs, whereas the administration of

the agricultural trade associations is almost universally entrusted to the municipal self-administrative authorities.

Industrial trade associations are now 65 in number, divided into the following industrial groups, namely, building trade, 14; textile industry, as well as the iron and steel industry, 8 each; alimentary, &c., trade, 7; wood industry, land and water carriers' trade, 4 each; earthenware industry (glass, pottery, and tile trade associations), 3; paper (fine and ordinary) industry, metal and mining industries, 2 each; artistical engineering, chemical industries, gas and waterworks, book printers, leather, clothing, and musical instruments industries, 1 each.

There are 48 agricultural trade associations.

In connection with the works of the Empire, or the State, as well as in connection with the building works executed by municipal unions the assurance is carried out by the Empire, the State, or the respective municipal unions which have, for the purpose, constituted executive authorities. There are at present, 144 Imperial and State executive bodies and 249 municipal ones.

For the Regie (own) Building Works an assurance office has been established within each building trade association, which is, likewise, managed by the trade association. The trade associations take into account local circumstances by, if need be, establishing sections in the districts of larger municipal unions (provinces, counties), as well as by appointing local representatives (confidential men).

Pursuant to statistics of 1895, 5,248,709 concerns numbering 18,389,468 assured persons, are subject to accident assurance. The funds of the trade associations and assurance institutions amounted to 143,396,459 marks.

In connection with accident assurance—and contary to the practice of sickness assurance and infirmity and old age assurance—it is not the assured workman but the owners of the concerns, subject to compulsory assurance, who are members of the trade associations and the membership commences likewise, as in connection with sickness assurance, not first after notification but *ex lege*, from the moment the concerns starts business, *i.e.*, from the moment compulsory assurance takes effect. In accordance with this organization, notification is not made of the assured workmen but of the concerns, also the number of persons subject to compulsory assurance employed in the concern is merely indicated in figures. The names of the assured persons become known to the trade associations only through the statement of wages, rendered annually by the employers in connection with the past business year.

A special association register is kept regarding the notified concerns.

The object of the assurance is to make good the loss sustained through physical injury or death. In case of injury the indemnity should be:—

1. The costs of the medical care which are incurred from the commencement of the 14th week after the occurrence of the accident (the sickness fund has to provide at least until then);
2. The payment of an allowance to the injured from the beginning of the 14th week after the occurrence of the

accident during the time of his disability, the same to be calculated according to the wages last earned. The allowance amounts to:

a. In case of total disability and during its duration, 66⅔ per-cent of the wages;

b. In case of partial disability and during its duration, a fraction of the rate as per *a*, the fraction to be computed in proportion to the remaining wage-earning power.

The trade associations are empowered to transfer to the sickness fund of which the injured is a member, conditionally on making good the costs accruing to the fund thereby, the case of the injured from the beginning of the 14th week to the end of the medical cure. To those assured who are not assured in accordance with the regulations of the Sickness Assurance Law, the employer has to defray, himself, the minimum grants prescribed by the latter law for the first 13 weeks. From the beginning of the 5th week after the occurrence of the accident until the expiry of the 13th week the sickness money is to be computed at two-thirds at least of the wages, serving as basis to the calculation. The difference between these two-thirds and the lowest amount of sickness money to be granted according to law or statute, is to be refunded to the sickness fund concerned by the owners of the establishment where the accident took place. In case of death, there is to be paid, besides, as indemnity:

1. To defray the funeral expenses, 20 times the daily wages but not less than 30 marks.
2. To the family of the deceased, an allowance commencing from the day on which death occurred. The same amounts to:

a. For the widow of the deceased, until her death or re-marriage, 20 per-cent; for each surviving fatherless child until it has reached 15 years of age, 15 per-cent; and if the child is or becomes motherless, 20 per-cent of the wages.

The allowances to the widow and children are not to exceed together 60 per-cent of the wages; if the amount be larger, the individual allowances are reduced proportionately.

In case of re-marriage, the widow shall receive as final compensation three times the amount of her annual allowance.

The widow has no claim to compensation if the marriage has only been contracted after the accident.

b. For progenitors of the deceased, if the latter was their sole support, 20 per-cent of the wages for the time until their death or until their need of support ceases.

When there are several claimants under *b*, the allowance is granted to the parents before the grandparents.

If there are claimants under *b* as well as under *a*, the claim of the former is considered only to the extent that the maximum amount of the allowance is not required by the latter.

The family of a foreigner which at the time of the accident was not domiciled in the country has no claim to the allowance. Foreigners who permanently quit the Imperial territory, may be paid by the trade association a sum of money to satisfy their claim to compensation.

In lieu of payment of the costs of medical care and of the allowance, in case of injury, gratuitous care and boarding may be granted in some hospital until the end of the cure. During the time the injured person is being attended to in the hospital, the aforesaid relatives of the same are entitled to the survivors' allowance, in so far as they would have a claim to it, in case of death of the injured.

It should be specially mentioned here, that accident assurance only applies to accidents incurred in business, *i.e.*, to accidents connected with the particular dangers of the business.

The average results of the allowances are shown in the following statement:

Business Year	To any one Assured Apply Marks					To any one Accident Apply Marks	For every 1000 Assured there are Persons Indemnified				Of 100 Marks Indemnity Apply			
	Contributions of		Outlays of		Funds		Injured Persons	Survivors			Allowances to		Expenses of	
	Employers	Workmen	Indemnity	Administration				Widows	Orphans	Parents	Injured	Survivors	Medical Cure	Burial
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
In the Year 1890	2·98	...	1·40	0·40	5·52	200·00	6·3	1·0	1·9	0·1	68·66	21·35	8·61	1·38
In the 50th year	6·86	...	6·40	0·40	13·72	200·00	21·7	8·3	5·0	0·3	67·44	30·20	2·04	0·32

The general expenses of management in connection with accident assurance amount to about 8 per-cent of the total income.

The accidents occurring in an assured concern and causing the death of a person employed therein or causing physical injury to such a person entailing disability to work for a term of more than three days or ultimate death, must be notified in writing (as per special form) by the employer to the local police authorities (accidents at sea to some naval office). These authorities have to investigate the accidents notified under advice to or co-operation of the employer, the representative of the sickness fund, and the injured person as well, if need be, in conjunction with witnesses and experts, and they have to ascertain:

1. The nature and cause of the accident;
2. The persons killed or injured;
3. The nature of the injuries sustained;
4. The whereabouts of the injured persons;
5. The survivors of the persons killed through the accident, who according to law are entitled to claim compensation.

The costs of these investigations are borne by the trade association concerned.

After this the indemnities payable to the assured injured through accident, or to the surviving relatives of the assured killed through accident, are fixed by the trade association, or its relative branch. This settlement is to be arrived at by the authorities without any request being needed from the claimants. Before the settlement of the indemnity, an opportunity is to be afforded to the claimants, by communication of the particulars upon which the indemnity is to be assessed, to express an opinion thereupon within a week. Claimants to indemnity for which the indemnity is not fixed by the authorities, have

to notify their claim under penalty of forfeiture, before the expiry of two years after the happening of the accident.

In establishing the degree of disability required in order to receive an allowance, it should be borne in mind that the damage, *i.e.*, the economical disadvantage which has accrued to the injured through the injury is to be made good. By disability, in the meaning of accident assurance, is understood a certain restriction of the physical and mental conditions, *i.e.*, a deficiency of the physical or mental faculties, by which the assurer is hindered from producing, or it is rendered more difficult for him to produce, by way of quantity or quality, the same as hitherto in the labour and business market. This diminution of the earning power is not identical with the earning disability connected with sickness assurance. Whereas, in the latter case, owing to the temporary nature of the illness, the inability to work in any particular profession, or even in any particular concern, suffices in order to receive sickness money, it is necessary, in connection with the more or less permanent nature of accident or infirmity allowance, that the earning disability should extend to the whole economical field, which is open to the assured by reason of his powers and abilities, as well as by reason of his social position and customary habits of life.

It is open to the interested parties to appeal to the Court of Arbitration against the decisions declining the claim to compensation or assessing the indemnity, and against the decisions of the latter to the Imperial Assurance Department. The procedure in connection with both judicial courts is gratuitous.

When an indemnity is assessed, the claimants receive a notification to that effect. The indemnities fixed by virtue of the Accident Assurance Law may not, generally, be mortgaged. Should some material change occur in the circumstances in respect of which the indemnity was fixed, a new assessment may take place upon application or by the authorities.

The payment of the indemnities is effected through the Post Offices of the district where the domicile of the claimants is situated. The amounts laid out by the offices are recovered from the Trade Associations affected through the intermediary of the Central Post Office.

The recovery of the amounts due by the employers is effected differently. Generally speaking, the system of assessment predominates. It is practised particularly in the cases of the industrial building and agricultural associations, as well as the seafaring association. According to this system, the sums paid and recoverable by the Central Post Office are recovered from the boards of direction of the associations together with the expenses of administration, and the prescribed allotments to the reserve fund are assessed and collected, pursuant to the scale of apportionment laid down, from the association members. The scale of apportionment is derived from the statements of wages, which the association members have to supply to the association boards at the close of each financial year, and which must contain:

1. The assured persons employed in the establishment during the past year, and the wages and salaries earned by them;
2. A calculation of the wages and salaries to be taken into consideration in connection with the assessment of the contributions;

3. The class of risk applied to the establishment.

The classes of risk are to be established by the Associations' General Court in respect of the establishments pertaining to the association in accordance with the degree of danger involved in them as ascertained by the accident statistics, at the same time fixing the amount of contributions to be paid by each class of risk (tariff of risks.) The preparation and modification of the tariff of risks is subject to the approval of the Imperial Assurance Department. The rating of the establishments according to the several classes of risks is incumbent upon the officers of the association. Complaints by the employer against the rating are to be addressed to the Imperial Assurance Department. The tariff of risks is to be revised every five years.

The association members are entitled to protest to the Assocation Board against the contributions fixed, and to lodge a complaint with the Imperial Assurance Department against the decision of the Board. Unpaid contributions are levied as municipal rates.

The Underground Builders' Association and the Insurance Institutions of the Underground Builders Associations, established in connection with public buildings, have adopted the system of *capital covering*, owing to the fluctuating nature of the establishments assured by them. This system consists in raising every year the capital value of the permanent allowances which have accrued during the year. The capital value, respecting the calculation of which the Imperial Assurance Department has laid down fixed principles, published in the official news ("Amtliche Nachrichten") of the year 1894, No. 3, corresponds to the sum which, enhanced by interest, would probably suffice to bear the charge of the permanent allowances during the time they will be payable. As, however, from the capital value calculated in respect of newly-fixed allowances, the capital values are to be deducted, which, owing to death, have lapsed during the preceding year, the year's requirement, in the shape of capital covering is to be calculated according to the said directions of the Imperial Assurance Department, as follows:

There are to be calculated annually :

a. The total funds (debit-covering funds) mathematically required in order to make good all future annuity obligations arising out of all accidents in respect of which allowances were payable at the end of the year;

6. The amount of the capital covering (credit-covering funds) resulting from preceding years, and remaining after deduction of the allowances paid during the year.

The excess of the debit-covering funds resulting from the difference between these two sums, represents the covering capital required for the year, and which is to be included as such in the year's account. In addition to the covering capital, the expenses of management, the single indemnity allowances, and the payments of allowances of a temporary nature, are to be included in the year's account. The apportionment of the contributions to be levied in this connection is effected in accordance with the wages and salaries, &c., earned by the assured engaged in the works of the members, as well as in accordance with the statutory tariff of risks. In connection with the contributions, quarterly advances are to be made by the association members.

The procedure of assessment and the procedure of capital covering

both have their advantages. Generally it is necessary to the security, stability, and beneficial development of every assurance undertaking—hence, also of the public legal workmen's assurance—that the institution shall be founded on technical assurance principles (as is the case in connection with the procedure of capital covering), because only these offer something tangible, something concrete. The estimative, or commercial, calculation of the anticipated assets and liabilities does not suffice in connection with assurance, where the question affects not only the present, but also the future solvency. It might, for instance, happen in connection with the trade associations, acting upon the procedure of assessment, that in case of some unfortunate war or any other financial depression, they would be obliged to make large demands upon the solvent members of a nature difficult to be complied with, if they did not wish to fall into difficulties in connection with the payments necessary for the care of the injured. Even the hypothetical coefficient of probability presents, in the hands of a prudent and experienced actuary, always more safe material than the estimative and commercial statements which are confined absolutely to the present. In agreement with this opinion, the Imperial Government provided, therefore, in connection with the projected form of accident assurance, referred to in the first Bill (submitted on the 8th March 1881), the premium system which is closely related to the procedure of capital covering.

Nevertheless, I should not like, in the present instance, to reject altogether the procedure of assessment. As was already represented by several speakers at the "International Congress of Workmen's Accidents and Social Assurance", held at Brussels from the 26th to the 31st July 1897, it is important that in connection with such a considerable public institution as is the German workman's assurance, economical points should be prominently taken into consideration, side by side with technical ones. Looked at from this point of view, it is of course in the interest of commerce, agriculture, and industry that still greater sums of capital shall not be withdrawn from the market than is already the case through the German workman's assurance. Such a large withdrawal of capital operates doubly disadvantageously; on the one hand it weakens the producing power of the business world, and on the other hand the large volumes of capital which are withdrawn from the market and which have to be invested in mortgages, safe investments, &c., react oppressively upon the rate of interest. Apart from this, the trade associations offer a certain security through the guarantee of the State, and finally they have, by way of security to fulfil their obligations, to accumulate a reserve fund. To form the same the amounts of compensation to be levied are to be enhanced—

At the	1st	assessment	by 300	per-cent,
„	2nd	„	„ 200	„
„	3rd	„	„ 150	„
„	4th	„	„ 100	„
„	5th	„	„ 80	„
„	6th	„	„ 60	„
„	7th	„	„ 50	„
„	8th	„	„ 40	„
„	9th	„	„ 30	„

At the 10th assessment by 20 per-cent,
„ 11th „ „ 10 „

After expiry of the first eleven years, the interest on the reserve fund is to be added to the latter until it (the reserve fund) has reached double the annual requirement. When this is the case, the interest may be applied, provided the amount of the reserve fund exceeds twice the amount of the current annual requirement, to cover the association charges. As further security, the trade associations may combine together, with a view of bearing the risk mutually, subject to the approval of the Imperial Assurance Department.

The supervision in respect of the observance of the legal and statutory regulations on the part of the associations is carried on by the Imperial Assurance Department, without prejudice to the responsibility towards the people's representatives, as regards the measures adopted by the Imperial authorities, pertaining to the Imperial Chancellor or his representative, namely, the Secretary of State for Home Affairs, according to the Imperial Constitution or the Imperial law relating to the Chancellor's assistant, of the 17th March 1878. The decisions of the Imperial Assurance Department are final. In Federal States where State Assurance Departments are established, the latter undertake a portion of the supervising functions of the Imperial Assurance Department.

The obligation on the part of the communes or Poor Unions to assist needy persons is not affected by this law.

The liability of the employer has practically remained the same as under the exclusive rule of the Liability Law of the 7th June 1871 —the obligations laid down by the latter having largely remained in force—except that in lieu of the unbusiness-like workman the employer is now confronted, in most cases, by the very business-like trade association. The Accident Assurance Law of the 6th July 1884 contains thereanent the following regulations:—

S. 95. The persons assured by virtue of this law and their survivors may only put forward a claim to compensation for damage caused by accident against such employers, managers or representatives, factory inspectors or foremen, who, by way of criminal verdict, have been declared to have caused the accident by premeditation.

In this case the claim is limited to the amount by which the compensation due to the claimants under the existing legal regulations exceeds the compensation to which they are entitled according to this law.

S. 96. Those employers, managers or representatives, factory or workmen inspectors, against whom it has been decided, by way of criminal verdict, that they have by premeditation or carelessness, disregarding the attention to which, by virtue of their functions, profession, or trade, they are specially bound, caused the accident, are liable for all allowances granted by trade associations or sickness funds in consequence of the accident, by virtue of this law, or of the law relating to workmen's sickness assurance of the 15th June 1883.

As compensation for the allowance, its capital value may be claimed in these cases.

S. 97. The claims described in S. 95 and 96 may also be enforced, without the decision referred to therein having taken place by criminal verdict, provided such decision cannot be effected on account of the

death or absence of the person in question, or on account of any other reason depending upon him.

Whereas S. 95 provides a right to claim to the injured or to the survivors of the person killed, S. 96 confers such a right on the trade associations and sickness funds. It is true that the trade associations have made a very moderate use of their rights, some even none at all. Pursuant to a statistical survey undertaken by the Liability Protection Union of German Manufacturers, in which 30 trade associations, comprising 2,532,609 assured persons took part, 19 trade associations had not, in the years 1889 to 1894, availed themselves at all of their right of countervailing claims. The other 11 trade associations had during the same period made 145 claims by virtue of S. 96, 97, and 59 claims by virtue of S. 98 of the Accident Assurance Law (liability of third persons), in all 204 claims, some of which, it is true, were for considerable amounts. This moderate use of their right of recourse on behalf of trade associations is also quite legitimate, inasmuch as the object of workmen's assurance is, in fact, to remove social dissatisfaction and not to stimulate it.

Older assurance contracts concluded by employers with private assurance companies against the consequences of industrial accidents, subject to accident assurance laws, were transferred, after the coming into force of the legal accident assurance, to the respective trade associations, at the request of the employers. As most assurances were effected simultaneously,

1. Against the consequences of the legal liability,
2. Against the consequences of physical accidents during work generally

(so-called combined collective assurance), the question was raised in the practice whether, and how far these contracts were divisible, seeing that the trade associations took over the contracts only in so far as they related to trade accidents (*i.e.*, to those mentioned under 2). This division was recognized by the highest courts, especially by reason that the aforesaid contracts mostly comprised already two distinct parts. Although the premium for both assurances was fixed collectively in the policy, the tariffs did not contain any collective premium, but rates for each of the two assurances. Further, the procedure always adopted was that the premium for the assurance under 2 was agreed to according to the tariff, and that, according to the amount of the assurance, rebates were only allowed as to the premium for the assurance under 1. The trade association could hence undertake, without difficulty, the assurance under 2 at the full premium fixed for this class of assurance, whereas the employer retained the assurance under 1. Owing to the separation of the former bearer of the risk into two, the liability premium (under 1) could naturally now be claimed from the employer in full (*i.e.*, without rebate).

The public authorities must, upon request, afford legal assistance to the trade associations, and these must act likewise to one another.

All arbitration and extra-judicial negotiations and documents required in connection with the proving and adjustment of the legal relations between the trades associations and the assured are free of fees and stamp duty.

Contraventions against the regulations of the Accident Laws are

subject to penalty. The penalties are inflicted by the trade association boards by way of regulation penalties.

Beside the laws already mentioned, the law of the 15th March 1886, relating to the protection of officials and persons belonging to the military profession in consequence of industrial accidents, (so-called Accident Provident Law for Officials) should be mentioned. The same is less an accident assurance law than a pension law, inasmuch as it really purposes, for reasons of equity, to allow, in connection with industrial accidents, a higher pension to the categories of officials and military men specified in the law.

Just as the whole German workman's assurance has been of sanitary utility, the accident assurance has also contributed to increase the security of the workmen against the dangers inherent to the trades. The trade associations, in particular, have done excellent work in connection with their regulations as to prevention of accidents—as is recognized on all sides—including the State, factory, and medical inspectors. The accident prevention regulations of the trades associations form an effective and valuable assistance to the measures adopted by the authorities to the same end, also the cordial co-operation of the inspectors appointed by the trades associations, to supervise the establishments of their members, with the State inspectors, has proved to be very beneficial. The individual trade associations have issued, accordingly, by virtue of the legal authority, accident prevention regulations for their members, whose execution is thereby rendered more easy, in that the trade associations are empowered, on the one hand, to punish neglectful employers by taxing them according to a higher class of risk or by charging some additional premium to their contributions, and, on the other hand, to inflict fines upon careless workmen. Specially valuable and interesting are the regulations issued by the trade associations in connection with the protection of workmen at factory fires and the prevention of the same, of which an extract was contained in the annual reports of the Royal Prussian Trade Counsellors, &c., year 1890. Finally, at the instance of the trade associations, normal accident prevention regulations have been issued quite recently, namely :

(*a*) For agricultural and forestry pursuits (in the year 1895),
(*b*) For similar dangers in the industrial establishments subject to accident assurance laws (year 1896),

with the object of promoting a certain homogeneity in this branch. The inspectors of the trade associations are bound to keep secret any trade secrets coming to their knowledge in the course of their inspection. Contraventions against this regulation are heavily punished.

It cannot be denied that through these accident prevention regulations, as well as through the improved hygienic regulations, issued by the Imperial and State authorities, and traceable to the influence of the workman's assurance and its officers, a material diminution of the danger of accident in the fields of industry, agriculture, &c., has been achieved, although of course there still remains much to be done in the matter. For instance, according to the accident statistics for 1887, issued by the Imperial Assurance Department, nearly 7,000 accidents (*i.e.*, 43 per-cent of all accidents liable to compensation) were caused through the hazardous nature of the industries, so that,

at the present time, prevention of these accidents, in the existing state of science, does not appear possible. These figures speak more than all commentaries in favour of the necessity that all efforts should more and more be directed towards the improvement of industrial hygiene and the prevention of accidents. That the Imperial and State authorities can show some success in this direction follows from the following Table, which is prepared from the reports of the trade associations, published in the "Official Reports of the Imperial Assurance Department", years 1888 to 1897. The Table includes the accidents which occurred in connection with the industrial and agricultural trade associations, the State and municipal executive authorities, as well as in connection with the insurance institutions established in respect of the building trade associations. It is, hence, prepared on the broadest basis possible, in order to obtain sufficiently large figures for comparison, which was necessary in view of the relatively short time of observation (10 years). I should remark here that the number of assured referred to in column 2 may be somewhat too high, as some assured may have been counted twice.

The *temporary* disability (column 8) embraces the accidents respecting which a full reinstatement of the earning power, by the time of the preparation of said tables on behalf of the trade associations, &c., had taken place, or was anticipated ultimately; the *permanent* disability (column 6) embraces all accidents respecting which, at the time of the preparation of the tables, full earning disability was established or could be anticipated with certainty. All other cases are, in so far as they were not to be considered as fatal accidents (column 5), included under those of permanent partial disability (column 7).

Year	Number of Assured	Accidents Notified	Of which Accidents subject to Compensation	Of those Accidents subject to Compensation terminated			
				By Death	With Permanent Earning Disability		With Temporary Earning Disability
					Complete	Partial	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1886	3,725,313	100,159 = 26·9 per 1,000 assured	10,540 = 10·5 % of column 3	2,716 = 25·8 % of column 4	1,778 = 16·8 % of column 4	3,961 = 37·6 % of column 4	2,085 = 19·8 % of column 4
1887	4,121,537	115,475 = 28·0 per 1,000 assured	17,102 = 14·8 % of column 3	3,270 = 19·1 % of column 4	3,166 = 18·5 % of column 4	8,462 = 49·5 % of column 4	2,204 = 12·9 % of column 4
1888	10,343,678	138,057 = 13·4 per 1,000 assured	21,236 = 15·4 % of column 3	3,692 = 17·4 % of column 4	2,216 = 10·4 % of column 4	11,097 = 52·3 % of column 4	4,231 = 19·9 % of column 4
1889	13,374,566	174,874 = 13·1 per 1,000 assured	31,449 = 18·0 % of column 3	5,260 = 16·7 % of column 4	2,908 = 9·3 % of column 4	16,547 = 52·6 % of column 4	6,734 = 21·4 % of column 4
1890	13,619,750	200,001 = 14·7 per 1,000 assured	42,038 = 21·0 % of column 3	6,047 = 14·4 % of column 4	2,708 = 6·4 % of column 4	22,905 = 54·5 % of column 4	10,378 = 24·7 % of column 4
1891	17,382,827	225,337 = 13·0 per 1,000 assured	51,209 = 22·7 % of column 3	6,428 = 12·5 % of column 4	2,595 = 5·1 % of column 4	28,097 = 54·9 % of column 4	14,089 = 27·5 % of column 4
1892	18,014,280	236,265 = 13·1 per 1,000 assured	55,654 = 23·6 % of column 3	5,911 = 10·6 % of column 4	2,664 = 4·8 % of column 4	30,992 = 55·7 % of column 4	16,087 = 28·9 % of column 4
1893	18,118,850	264,130 = 14·6 per 1,000 assured	62,729 = 23·8 % of column 3	6,336 = 10·1 % of column 4	2,507 = 4·0 % of column 4	36,670 = 58·5 % of column 4	17,216 = 27·4 % of column 4
1894	18,191,747	282,982 = 15·6 per 1,000 assured	69,619 = 24·6 % of column 3	6,361 = 9·1 % of column 4	1,784 = 2·6 % of column 4	39,487 = 56·7 % of column 4	21,987 = 31·6 % of column 4
1895	18,389,468	310,139 = 16·9 per 1,000 assured	75,527 = 24·4 % of column 3	6,448 = 8·5 % of column 4	1,706 = 2·3 % of column 4	41,052 = 54·4 % of column 4	26,321 = 34·8 % of column 4

According to the foregoing table, there would appear to be an increase in the number of accidents since the coming into force of the

Workmen's Assurance Laws, at least in connection with the accidents subject to compensation (column 4), and in connection with the minor accidents entailing temporary earning disability (column 8), whereas, as regards accidents involving permanent but only partial earning disability (column 7), in respect of which some increase was formerly apparent, a decline can be discernible during the last two years. The increase in minor accidents referred to is only an apparent one. The longer workman's assurance exists, the better do its regulations become known in the quarters interested, and all the more do those interested recognize the advantages of assurance and endeavour to make use of them. It thus happens that cases of injury are now reported as accidents which were not formerly noticed by anyone; for instance, insignificant injuries to the hand, the foot, or the shinbone. The increase of smaller accidents will, in all probability, gradually decline and pass into a slightly fluctuating permanent situation, as is already now to be partially observed. Quite pronounced, however, is the improving influence of accident assurance upon the more *serious* accidents, such as those resulting in death or permanent total earning disability (columns 5 and 6), in connection with which, it is true, the absolute figures have not, but the relative figures have, materially declined, and this, as regards accidents with deadly issue, from 25·8 to 8·5 per-cent, with consequent permanently complete earning disability from 16·8 to 2·3 per-cent of all accidents liable to compensation. And this decrease of the serious accidents is most important, both from the social and the ethical point of view. For the loss, as regards the welfare of the family and the community, is not nearly so great in the case of temporary earning disability, or even in that of permanent partial earning disability, as in the case of permanent complete earning disability or the death of the breadwinner. Whereas, the injured person, retaining a certain degree of earning power, remains a useful member of human society, the fully disabled workman constitutes a constant charge, and the death of the breadwinner causes an irretrievable gap in the family life.

Like sickness assurance, accident assurance has, in so far, been of useful service in a sanitary respect, as the trade associations have, by establishing hospitals (especially the guilds' associations), convalescent homes, medico-mechanical institutions, &c., laid themselves out to promote, if possible, a complete cure of those accidentally injured. An institution of great and happy influence in this respect are the accident stations established in Berlin by the trade associations, which are partly connected with the already existing sanitary posts, and constitute, by means of their organized conveyance of patients, an excellent salvage institution, and, during the short time since their creation (1894), have rendered excellent service. These stations, originally established for the objects of the trade associations only, are now at the service of everyone, and enjoy already considerable popularity. The fourteen accident stations are open day and night. They constitute surgical dressing stations for preliminary assistance, and possess already seven depôts, with ten ambulances (own carriages). To three stations (chief stations) clinical hospitals are attached of 20 to 30 beds, which, however, are private establishments of the leading doctors in charge. A section of the Berlin sickness funds has already entered into a fixed contract arrangement with the

accident stations. The stations do not enter into unfair competition with the doctors; because, although they do not act harshly towards the poor, and render first aid without applying for payment beforehand, they, nevertheless, take care that their services are paid for by persons able to do so. The aid of the accident stations has, during recent years, been applied for by more than 20,000 persons annually.

Finally, accident assurance would appear to have acted beneficially upon drunkenness. This is also recognized by a leaflet issued by the German Society against the abuse of intoxicating drinks, on the occasion of the "German Exhibition for Prevention of Accidents" (Berlin, 1889), inasmuch as it sets forth that in connection with the more hazardous trades, most fertile in accidents, general compulsory assurance reacts against the economical loss caused by accidents, seeing that it induces fellow-workmen to exercise mutual supervision, and that it has brought workmen in quarries and similar trades voluntarily to dispense altogether with drink while at work.

D.—Infirmity and Old Age Assurance.

In accordance with the message from the Throne of the 17th November 1881, infirmity and old age assurance forms the keystone of workmen's assurance. Until then, similar institutions existed in Germany only in connection with the guilds' associations, already referred to several times, as well as in connection with the Imperial, Prussian, Saxon, and Bavarian Railway Administrations. Besides, a few large establishments had established such funds of their own accord.

The introduction of this class of assurance was initiated by the publication, on the 17th November 1887, the anniversary of the aforesaid message, of the " General Outlines of Old Age and Infirmity Assurance of Workmen, accompanied by a Memorial", prepared by the Imperial Home Office, in which memorial the care of widows and orphans was dwelt upon, in so far as it explains that the simultaneous regulation of the protection of widows and orphans was certainly desirable, but that, for the time being, it was preferable not to approach this portion of social political legislation, in order to arrive first, by means of the experiences to be collected in connection with the carrying out of old age and infirmity assurance, at a proper judgment as to whether industry and the other trade branches affected would be able to bear the material increase in the charges necessarily involved in the protection of widows and orphans. These general outlines proposed to establish for infirmity and old age assurance, in connection with every trade association, an assurance institution after the style of the assurance institutions for public buildings attached to the building trade associations. After the Prussian Politico-Economical Council had been heard with regard to the outlines, a formal Bill was drawn up and submitted, in April 1888, to the Federal Council, but it did not reach the Imperial Parliament. This Bill was revised, pursuant to the decisions of the Federal Council, and again published (July 1888). After this new publication had again been discussed, both from a theoretical and practical point of view, the Bill was once more subjected to revision by the Federal Council, and then submitted, towards the end of 1888, to the Imperial Parliament, accompanied by a full preamble and a memorial, explaining the statistical and

mathematical bases. A thorough discussion followed thereupon, both in Committee and by the House, resulting in the final Imperial Law relating to infirmity and old age assurance of the 22nd June 1889.

The following persons are subject to this law as soon as they have reached 16 years of age, namely:

1. Persons who are employed as workmen, clerks, journeymen, apprentices, or servants, in receipt of wages or salary;
2. Trade officials, commercial clerks, and apprentices (excluding clerks and apprentices employed in pharmaceutical chemists' shops) receiving wages or salary, but whose regular annual income in the shape of wages or salary does not exceed 2,000 marks; as well as
3. Persons employed by means of wages or salary and belonging to the crews of German sea-going ships and of ships carrying on inland shipping.

An occupation entailing as remuneration board and lodging only is not looked upon, in the light of this law, as an occupation subject to compulsory assurance.

By decision of the Federal Council liability to assurance may be extended:

1. To employers who do not regularly employ at least one journeyman, as well as
2. To such independent traders, regardless of the number of wage-earning workmen employed by them, who are engaged in their own workshops at the request and on account of other traders in producing or manipulating industrial products (home traders).

Pursuant to this power the Federal Council has extended compulsory assurance to the home traders connected with tobacco manufacture and the textile industry.

The following are freed from compulsory assurance:

1. Officials of the Empire and the Federal States, the officials of municipal associations or other public associations entitled to pensions, as well as persons belonging to the military profession who during their service are employed as workmen;
2. Persons who, owing to their physical or mental condition, are permanently no longer able, by means of some wage-earning work corresponding to their power and abilities, to earn at least a third of the daily wages of ordinary journeymen current in the locality where they are engaged (invalids), as well as such persons who by virtue of the present law already receive the infirmity pension.

The following may be exempted at their own request:

3. Such persons who draw pensions or allowances amounting at least to not less than the minimum infirmity pension from the Empire, any Federal State or municipal association, or who are entitled by virtue of regulations of the Imperial Law respecting accident assurance to draw a pension amounting to the minimum infirmity pension.

By decision of the Federal Council, temporary services may be exempted from compulsory assurance. By virtue of this power the Federal Council has exempted amongst others: Persons who, without being professional wage-earning workmen, are employed quite casually or at a very small allowance, or to assist at accidents, &c.; persons who, not belonging to the crew, do service abroad on sea-going ships; waiters and waitresses, as well as similar persons engaged in lower housework of short duration and at different places; finally, duties carried on in charitable institutions or similar institutions, for money compensation granted, not as an allowance for work performed, but as help towards better advancement.

By the side of compulsory assurance the law recognizes *voluntary* assurance, which takes two forms. Firstly, as *self-assurance* (joining assurance voluntarily). The same is allowed to minor employers and to craftsmen not subjected by the Federal Council to compulsory assurance by virtue of the power granted to it by law (*vide* above) and who have not yet reached 40 years of age. Secondly, as *voluntary continuation of the assurance.* This form is allowed to assured who would withdraw from compulsory or self-assurance, because the considerations calling for these relations are no longer applicable, regardless as to whether this withdrawal be permanent or only temporary (for instance, through temporary want of employment). A variety of this form is the *voluntary renewal of assurance,* which has expired owing to the non-payment of contributions for a time of greater or less duration.

Self-assurance and voluntary continuation of assurance may generally only take place in connection with II, Class of Wages (*vide* later); the assured in question have also, in addition to the ordinary contribution check, to provide an additional check (both combined forming a so-called double check). Exceptions are allowed: (*a*) For small employers who as a rule do not employ more than one wage-earning workman, if they were formerly subject to compulsory assurance during not less than five years and corresponding contribution checks have been used for them during this time respecting the voluntary continuation or renewal of the assurance; (*b*) for four months at the outside, in case a constant employment with some particular employer is discontinued for a time (for instance, on account of bad weather, want of work, &c.), but is to be continued again later on. In both exceptions additional checks need not be used; in the case of (*b*) checks of II, Class of Wages, are not exclusively used, but the checks hitherto used in the particular employment may further be made use of.

The application of the infirmity and old age assurance is carried out, under State guarantee, through special assurance offices established for larger municipal associations (provinces, &c.), or for the area of a Federal State. Apart from these assurance offices, funds granting to their members at least the same protection as is prescribed by the law for all those subject to compulsory assurance may be admitted as special funds in connection with the application of the infirmity and old age assurance. The latter has been done in connection with the pension funds of the Imperial and State Railway Administrations as well as in connection with the Pension Funds of the Guild Unions.

There are at present 31 assurance offices and 9 special funds

(5 for railway administrations, 4 for guilds), comprising about 11,585,000 assured persons. The funds of these 40 institutions amounted to 414,000,000 marks at the end of 1895.

A notification of the persons subject to compulsory assurance is generally not prescribed. Only in the case of the collection of the contributions being effected through special collecting places may regulations respecting the obligation of notifying admission and withdrawal of the assured be issued and contraventions be liable to a fine not exceeding 100 marks.

The object of the assurance is the claim to granting

(*a*) An infirmity pension, or

(*b*) An old age pension.

The assured, who is permanently unable to earn a living, shall receive infirmity pension, regardless of his age. Inability to earn a living is to be admitted when the assured, owing to his physical or mental condition, is no longer able to earn, by means of some wage-earning work corresponding to his powers and abilities, at least an amount equal to one-sixth of the average wages pursuant to which contributions have been paid latest on his behalf, and one-sixth of the amount multiplied 300 times of the local daily wages of ordinary journeymen customary in the locality where he was last, although not merely temporarily, employed. Infirmity pension is also paid to the assured who is not permanently unable to earn a living, but who during a whole year has been unable to earn money, during the further continuance of his inability to work. If the infirmity has been caused by premeditation or in committing a crime, the claim to infirmity pension is forfeited. The signs of inability to earn a living are the same here as in connection with accident assurance.

Old age pension is paid, without it being required to prove inability of earning money, to the assured who has reached 70 years of age.

Infirmity pension is the main thing; it completes accident pension, which is granted only for industrial accidents, so that the workman is assured against all accidents to which he may be exposed, as well as against infirmity owing to age or illness.

Old age pension is intended only to enable the old workman, who is not yet infirm, to spare himself. That, in any case, plenty of persons reach the age of 70, and benefit by the old age pension, is demonstrated by the status of the 31st of December 1895, according to which, out of 11,585,000 assured in the German Empire, old age pension was granted to 269,450 persons, *i.e.*, to 23·26 per-cent of all assured, a figure which would have been much greater if in many cases the requisite certificates had not been missing. Still more interesting is it if one considers the circumstances of the working population of the Imperial Metropolis, Berlin, to which indeed the highest claims as to business fitness and working power are made. According to the status of the 31st December 1895, old age pensions were granted in Berlin to 3,017 persons out of 460,000 assured, *i.e.*, to about 6·56 per-cent of all assured, the oldest pensioner having been born in 1799. Amongst these 3,017 recipients of old age pensions were 2,162 men and 855 women; the largest contingent of these was supplied by the industrial occupations, especially the metal workers, whereas commerce and trade, which are so

prominently represented in Berlin, supplied comparatively but few old age pensioners. Enough assured reach, accordingly, the age required to receive old age pension; nevertheless, I hold the earlier granting of the old age pension most desirable, because to the old people in question the opportunity of obtaining work is rendered most difficult long before they reach that age, owing to the principles which are now customary in the field of industry and commerce, and even partially in agricultural pursuits. The times when the old workman could retain his occupation, even if his ability to work was reduced, are past, and it is only in large works and factories, as well as in the country on large estates, that the old patriarchal relations may still be found. Even commerce, which has retained longest the old relations, is withdrawing from them more and more, and seeks to renew its staff without at the same time caring for the old and exhausted material. Under these circumstances it would be desirable, by means of an earlier beginning of the old age pension, that the care of the old workman for himself and his family should be lightened.

The right to claim infirmity, as well as old age, pension depends upon:

1. The termination of the prescribed waiting time;
2. The payment of contributions.

The waiting time comprises:

a. In connection with infirmity pension, 5 years of contributions;

b. In connection with old age pension, 30 years of contributions.

47 weeks of contributions form one year of contributions.

In this connection the weeks of contributions, even if they fall within different calendar years, are added together until the year of contributions is completed. Times combining sickness with inability to work, and interrupting some fixed employment, as well as periods devoted to military service, are counted in connection with the calculation of the waiting time, as well as in connection with the calculation of the pension, and this respecting the second class of wages. Sicknesses which the assured has brought upon himself by premeditation, while committing a crime, by guilty participation in fights, &c., through drunkenness or sexual over-indulgence, are not counted, neither is the time in excess of one year in connection with sickness lasting more than one year.

As the old workmen for whom, as well as for the young ones, contributions are to be paid, would never have obtained an old age pension, and a large number of them would also not have reached the stage of receiving infirmity pension, if the waiting time were strictly maintained, the law has provided temporary regulations to meet the case, inasmuch as it reckons in favour of the assured, who becomes infirm during the first five years after the coming into force of the law, in respect of infirmity pension, the working time accomplished prior to the law, as well as under certain provisions, to the assured in respect of old age pension, who, at the time of the coming into force of the law had reached more than 40 years of age, all the years and weeks since he was 40 years of age he had accomplished at the time of the coming into force

of the law. In this connection periods of illness and periods of military service are, under the aforesaid conditions, as well as temporary interruptions of a fixed working engagement, up to a duration of four months, included in a calendar year.

With a view of estimating the contributions and pensions, the following classes of assurance (classes of wages) are formed in accordance with the amount of the annual income of wages:

Class I., up to 350 marks, inclusive;
Class II., above 350 marks, up to 550 marks;
Class III., above 550 marks, up to 850 marks;
Class IV., above 850 marks.

The actual earnings of the individual workman are not taken as the basis of the annual income of wages, but the customary local daily wages, or average annual wages fixed, in connection with the calculation of their contributions, by the administrative authorities, or by the sickness funds, as regards the different localities or districts. In calculating the pension, and in contradistinction to the sickness and accident assurance, the theory of equivalence applied by the proprietary assurance companies comes into operation, *i.e.*, the amount of the pension depends upon the amount and number of the contributions actually paid. Much has been said for and against the value of this theory in connection with the public legal workmen's assurance of Germany; in the special literature and press the claim of an uniform pension is ever and again recurring. The reasons of the legislator in introducing this theory were chiefly: To equilibrate, as far as possible, the pensions of the better-salaried industrial workmen domiciled in the dear industrial districts and the pensions of the lesser-paid agricultural labourers in the cheaper agricultural districts; as well as the endeavour to encourage the workman, by the prospect of receiving a higher pension, to pay more contributions by holding out longer at work. Both reasons cannot be simply dismissed; also the theory is very fascinating at first sight from a professional assurance point of view, because it makes the risk dependent not only upon the co-efficient of probability, but also upon actual facts, *i.e.*, upon fixed quantities. The theory of equivalence was, therefore, not without value at the outset, and the first beginnings of the infirmity and old age assurance, as the latter was largely erected upon hypothesis. Now, however, that sufficient statistical data have been collected to enable one to judge and rectify the defects of the Tables and principles observed at the drawing-up of the law, I hold the abolition of the theory of equivalence and the introduction of the uniform pension to be desirable. The reasons assigned by the legislator respecting his measure cannot be taken into consideration, because *local* interests need not, in my opinion, be considered in view of the fluctuating nature of our working population, and *personal* interests may be safe-guarded in some other way. For instance, in lieu of classes of wages, trade classes might be formed embracing different contributions and pensions, namely:

Class I. Servants and apprentices;
Class II. Agricultural labourers;
Class III. Industrial workmen, builders, and seamen.

Within each of these classes there need only be one uniform pension, and, correspondingly, one uniform contribution. The change of profession would not be harmful, as such change occurs generally

upwards, and this point might be taken into consideration when fixing the contributions. When the time of claiming the pension arrives, everyone would receive the pension of the class to which he has of late (perhaps during the last two years) chiefly contributed. It should, of course, be allowed to those persons who, during the course of the assurance, pass from a higher to a lower class, to maintain their higher assurance by means of voluntary payment of the higher contributions. Through such a division according to professional classes, the uncertainties would disappear which arise from the fact that in the same locality different rates of contributions exist for identical categories of workmen (all according to the nature of the sickness fund to which they belong, &c.), or, what is just as incomprehensible, that in two neighbouring localities of identical circumstances, and resulting, probably, from the fact alone that they are situated in two different administrative districts, different checks (marks) must be used for one and the same workman. A uniform pension would simplify very much the calculation and fixation of the pension.

The pensions are calculated for calendar years. They consist of an amount to be provided by the assurance institution, and of a fixed contribution by the State, amounting for each person, without exception, whether old age or infirmity pension, to 50 marks annually.

In calculating the portion of the infirmity pension to be provided by the assurance institution, an amount of 60 marks is taken as basis. The same increases with every completed week of contribution :

In class of wages I. by 2 pfennig.
„ „ II. „ 6 „
„ „ III. „ 9 „
„ „ IV. „ 13 „

The portion of old age pension to be provided by the assurance institution for every weekly contribution is :

In class of wages I., 4 pfennig.
„ „ II., 6 „
„ „ III., 8 „
„ „ IV., 10 „

As to old age pensions, not less, but also not more, than 30 years' contributions, or $30 \times 47 = 1{,}410$ weekly contributions, are computed. If for any assured more than 1,410 weekly contributions of various classes of wages have been effected, the calculation takes place in accordance with the 1,410 weeks of contributions, during which the highest contributions have been effected.

The pensions are payable in advance in monthly instalments. They are to be computed, in round figures, up to fully 5 pfennig upwards per month.

In order to furnish a demonstration of the amount of the pensions, I propose mentioning some of them hereafter. They are already averaged, and are established under the supposition that for the assured in question checks (or marks) of one class of wages only have been used. As a matter of fact, this will happen only rarely, it will rather happen in view of the fluctuation of the German working population, and in view of the local difference as regards the amount of the marks to be used for each individual assured, that generally, in the course of time, marks of various classes of wages are used.

As for an assured person, if he desires to obtain infirmity pension,

at least 5 years of contributions (235 weekly contributions) must have been paid, the minimum infirmity pension will amount annually to:

In class of	wages	I.,	Marks	115.20;
„	„	II.,	„	124.20;
„	„	III.,	„	131.40;
„	„	IV.,	„	141.00.

At the end of 50 years of contributions (2,350 weekly contributions) —a fixed maximum amount of infirmity pension is not recognized by the law—the annual infirmity pension amounts to:

In class of	wages	I.,	Marks	157.20;
„	„	II.,	„	251.40;
„	„	III.,	„	321.60;
„	„	IV.,	„	415.80.

The old age pension, in respect of which 30 years of contributions (1,410 weekly contributions) are always computed, amounts to:

In class of	wages	I.,	Marks	106.80;
„	„	II.,	„	135.00;
„	„	III.,	„	163.20;
„	„	IV.,	„	191.40.

As regards the weeks to be counted during the temporary period, in connection with old age pension, in respect of which no contributions have been paid (*vide* above), the enhanced rates of the class of wages corresponding to the average annual income of the assured during the last three years of contributions preceding the law (141 weekly contributions), are applied to the first ten years after the coming into force of the law, but not less than those of class of wages I. In this case, also, the actual contributions are solely considered in respect of the after legal period.

The following Tables show the situation as regards infirmity and old age assurance:

I.

Assurance Institutions and Special Funds	Number of the Pensions Established at the Assurance Institutions in 1895		Pension Shares Finally Undertaken in the Years 1891–1895			Thereof Remained Pension Shares on 31 December 1895	
	Infirmity	Old Age	Number	Annual Amount	Capital Value	Number	Annual Amount
	Pensions			1,000 Marks			1,000 Marks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Assurance Institutions	52,062	29,417	417,164	29,024·1	194,212·4	306,100	21,446·0
Special Funds . .	3,843	615	16,489	1,231·9	9,567·2	12,095	900·7
Total . .	55,905	30,032	433,653	30,256·0	203,779·6	318,195	22,346·7

The number of pension shares is not covered here by the number of pensions, as the pensions, to the payment of which several institutions contribute, are shown in respect of each of them.

II.

Assurance Institutions and Special Funds	Amounts Paid in 1895 Pursuant to Statements of the Assurance Institutions						Of this the Empire has to Provide
	Infirmity	Old Age	Total Pensions	Compensations to Wives of Assured Persons	Compensations to Survivors of Deceased Assured Persons	Grand Total	
	Pensions						
	1,000 Marks						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Assurance Institutions	14,223·9	25,997·9	40,221·8	158·5	53·5	40,433·8	16,215·7
Special Funds . .	1,301·7	578·5	1,880·2	0·1	7·3	1,887·6	597·7
Total . .	15,525·6	26,576·4	42,102·0	158·6	60·8	42,321·4	16,813·4

The number of pensioners was about 347,700 at the end of 1895. In 1895 the income amounted to about 115,200,000 marks, the expenditure to 31,970,000 marks; the contribution by the Empire to 16,940,000 marks.

III.

Average Results.

Business Year	To any one Assured Apply Marks					Annual Pension in Marks		Of 100 Assured		Receive	Of 100 Marks Pension Apply to	
	Contribution	State Contribution	Pension	General Expenses	Funds	Infirmity	Old Age	Infirmity	Old Age	Total Pension	Infirmity	Old Age
						Pension		Pension			Pension	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
In the 1st Year .	8·21	0·54	1·36	0·40	7·09	113·51	125·08	0·00	1·20	1·20	0·00	100·00
In the 50th Year	18·00	6·00	27·34	0·40	125·33	225·60	135·00	11·40	1·20	12·60	94·07	5·93

The general expenses in connection with infirmity and old age assurance amount to from about 4 per-cent to 5 per-cent of the total income.

Applications for pensions are to be addressed to the Lower Administrative Authorities of the place where the assured are domiciled (the Provincial Council or, in larger towns, the Municipal Council). The application is to be accompanied by the necessary vouchers (receipt card, certificates of work, medical certificates). The lower authorities confer with the confidential men appointed for the place where the assured is domiciled, afford an opportunity to the fund of which the assured is or was a member, to express an opinion, and then forward the proposal, duly certified, to the executive of the assurance institution whose contribution checks, as shown by the

receipt card, have been used in the last instance. Here the application is examined, and—unless the application is at once declined—the earlier receipt cards are claimed from the assurance institution (*vide* later) in whose custody they are. If the vouchers supplied are not sufficient, in order to arrive at a decision, further inquiries are to be made at the expense of the assurance institution. If the claim is recognized, the amount of the pension is to be computed at once, and written advice thereof to be given to the recipient showing how the pension has been calculated. Copy of the advice is to be forwarded to the State Commissioner (*vide* later). If the application is not recognized, it is to be declined by means of a written advice stating the reasons why it is declined. Appeal against the decisions declining or computing the claim may be lodged by the interested parties with the Court of Arbitration, and against the decisions of the latter revision may be applied for to the State Assurance Department. The revision may be applied for, however, on these grounds only:

1. That the decision in dispute rests upon the non-application, or erroneous application, of the existing law, or upon an error contrary to the clear purport of the Acts.
2. That the procedure is subject to material (formal) defects.

The procedure in connection with both legal interventions is gratuitous.

In adaptation to existing local circumstances, the pension may be paid partially in kind, in accordance with the local statutory regulations of the communes or districts, to agricultural and forest labourers who have usually received their wages partially in kind. To notorious drunkards the pension may be paid everywhere and entirely in kind. The claim to pension is transferred to such extent as the allowances in kind amount to, to the municipal association in whose district such regulations have been laid down, and the association undertakes to furnish the supplies in kind.

Pledging or transferring a pension is not allowed as a rule; an exception is permissible only with regard to certain claims by the wife, the legitimate children, the poor's unions, &c.

If the person entitled to a pension be a foreigner, he may, in the event of his discontinuing his domicile in the German Empire, be paid off by means of an amount equal to three times the annual pension.

Should the circumstances of the recipient of an infirmity pension change to such an extent as to render him no longer permanently unable to work, the pension may be disallowed.

The acquired right to claim a pension remains in abeyance:

1. In respect of such persons who are in receipt of an accident pension, so long and in so far as the accident pension, supplemented by the infirmity or old age pension, exceeds the amount of 415 marks;
2. For Imperial, State, and Municipal, and other officials, and persons of the military profession, so long and in so far as the pensions or allowances granted to them and supplemented by the infirmity or old age pension, exceed the amount of 415 marks;
3. So long as the claimant is undergoing a punishment depriving him of his liberty for a period exceeding one

month, or so long as he is kept in a workhouse or house of correction;

4. So long as the claimant does not reside in the country (a few frontier districts excepted).

As soon as the amount of the pension granted is finally fixed, a copy of the decision and the receipt cards are forwarded by the Board of the Assurance Institution to the Accountant's Office of the Imperial Assurance Department.

The Accountant's Office, consisting of mathematicians, executes all the work of the Imperial Assurance Department of a calculatory and actuarial character.

The Accountant's Office distributes the pensions between the Empire and the participating assurance institutions. The distribution takes place, after first of all setting aside the amount to be contributed by the Empire, in proportion to the contributions collected by the individual assurance institutions on behalf of the assured.

The assurance institutions which are to be advised of the distribution, may appeal to the Imperial Assurance Department against the distribution. The decision of the latter is final. As soon as the pension shares are finally apportioned between the individual assurance institutions, the Accountant's Office sends a copy of the distribution to the Board of the Assurance Institution, which has fixed the pension.

The payment of the pension is effected through the post-offices of the resident localities of the pensioners. To that effect the pensioners receive, after the settlement of the amount of their pensions, from the Board of the Assurance Institution, a claim certificate, proving their claim on the paying offices. The Central Postal authorities hand to the Accountant's Office of the Imperial Assurance Department vouchers for the amounts paid by them. Thereupon the Accountant's Office distributes the amounts advanced between the participating assurance institutions, and forwards to them proofs as to the individual amounts to be borne by them. A similar statement is to be forwarded to the Imperial Chancellor, with regard to the amounts to be borne by the Empire. At the end of every financial year, the Accountant's Office has to inform the Central Postal authorities of the amounts which are to be refunded by the Empire and the individual assurance institutions. Thereupon, the assurance institutions have to pay the amounts to be borne by them.

The refund is effected out of the available means of the institution. If such are not available, and should the reserve fund not be sufficient, the larger communal Union (province, &c.), or the Federal State, has to advance the requisite sum.

The funds requisite to the effective application of the assurance are provided by the Empire, the employers, and the assured.

The financial contribution of the Empire consists first of all therein, that it has to provide to every pension an annual addition of 50 marks, and, further, by taking over that share of the pension applicable to the duration of military service rendered by the assured. As the Empire is not interested in voluntary assurance to the same extent as in compulsory assurance, and the former does not subject it to the same amount of social political responsibility as is the case with compulsory assurance enforced by it, the persons assuring themselves voluntarily must, as already stated, apply generally, as equivalent to

the addition granted by the State to all pensions, an additional check, which costs 8 pfennig for every week's contribution, and is combined with the ordinary contribution check, forming a so-called double check, in respect of which exceptions are allowed only to very few categories of persons entitled to voluntary assurance, as, besides, already enumerated. The funds required by the State to fulfil its obligations are raised in the same way as its other requirements, namely, by introducing the amount annually in the Imperial Budget.

The expenses (pensions, general expenses, &c.) remaining, after deduction of the share of the pensions to be borne by the State, are covered by the current contributions allotted in equal shares to the employers and the employed.

As, in connection with accident assurance, doubt existed as to the course to be pursued for raising funds, the same scruples were encountered in connection with the organization of infirmity and old age assurance. The Government desired to introduce the premium system accompanied by gradual formation of covering funds, whereas the employers were strongly in favour of the assessment system chiefly adopted in connection with accident assurance. Neither of the two systems was victorious. A middle course was adopted, and the so-called capital covering procedure applied, already partially introduced in connection with accident assurance (Underground Builders' Association and the assurance institutions of high-builders' associations). Pursuant to this procedure, the contributions are to be assessed for certain periods (first ten, then every five years), in such manner that the capital values of the pensions to be fixed during this period are covered, but that, deviating from the premium system, the more elaborate covering of the reversions of those assured persons not as yet entitled to pensions should be discarded.

The amount of the contributions applicable to the first period of contributions is, based upon actuarial calculations, laid down by the law itself and is weekly, as follows:

I.	Class of wages	. .	14 Pfennig.
II.	„ „	. .	20 „
III.	„ „	. .	24 „
IV.	„ „	. .	30 „

As regards the later periods of contributions, the amount of the contributions, taking into account nonpayment owing to illness, is to be assessed on the above lines, and so that the general expenses, the amounts set aside to form a reserve fund (*vide* later), the expenditure expected to be caused by the refund of contributions (*vide* later), as well as the capital value of the shares to be provided by the assurance institution in connection with the pensions which in all probability will have to be granted during the period in question, are covered. Deficiencies or surpluses, duly ascertained in connection with the collection of the contributions up to date, are to be taken into account in such manner that a balance be established by means of the new contributions.

The fixing of the contributions is effected by the committee of the assurance institution with the deliberative co-operation of the board of the same, and subject to the approval of the decisions thereanent by the Imperial Assurance Department.

Many times the question has been raised and debated as to whether the actuarial data employed in connection with the introduction of infirmity and old age assurance have stood their test. These doubts are particularly set forth by friends of the assessment system against the security of the capital covering procedure. Now the memorial recently submitted to the Imperial Parliament, which was of a distinctly statistical and mathematical nature, sets forth explicitly "that the experiences gained during the first five years in "connection with the application of the law, have shown that the "preliminary estimates laid down at the time of the promulgation of the "law, notwithstanding the partial defects in the principles of the "calculations were sufficiently correct and have not been exceeded." These words are fully confirmed by the contents of the memorial. All assurance institutions have a surplus in the shape of covering capital, some even a considerable one. If, nevertheless, in connection with two assurance Institutions (East Prussia and Lower Bavaria), the contributions have not been sufficient to form the requisite covering capital, this fact is not due to defects in the actuarial principles, but to the quite special social and economical circumstances of the population in both these districts which contain an especially large agricultural population. The bad financial situation of both institutions referred to is due to the fact of an unforeseen and unfavourable displacement of the age groups of their assured. The reasons of this are to be found in:

1. The flourishing development of manufactures and commerce, and on the other hand the decline of agriculture;
2. The consequent change of occupation of the younger agricultural labourers, and their migration to the industrial districts, so that the average agricultural population becomes older and older;
3. The consequent earlier infirmity of the agricultural labourers and the earlier attainment of the age required to receive old age pension.

While the population engaged in mines, foundries, industry, and the building trades has increased between the issue of the two trade statistics of 1882 and 1895 by 3·61 per-cent, and the population engaged in commerce and trade has increased by 1·50 per-cent; the population engaged in agriculture, horticulture, cattle breeding, forestry, and fishing, has declined by 6·77 per-cent. How unfavourable the movement of the classes of age has been, for instance, for the Province of East Prussia, is clear from the fact that, in the years 1886–1890, in the district of the assurance institution, East Prussia, more persons of the *younger* classes of age (1869–1830) departed than arrived, namely:

In class of age	1869–1860 . .	15·9 per-cent.
„	1859–1850 . .	7·4 „
„	1849–1840 . .	4·2 „
„	1839–1830 . .	2·0 „

On the other hand, of the *older* classes of age (1829–1800), more persons arrived than departed, namely:

In class of age	1829–1820 . .	0·4 per-cent.
„	1819–1810 . .	0·4 „
„	1809–1800 . .	3·5 „

This experience has so far been increasing.

If we now compare the Table of infirmity deduced from our present experiences, it will be easily understood what influence such a displacement of the classes of age within the district of the assurance institution must have. According to the Table of infirmity referred to, there are annually per 10,000 assured:

In the class of	25	years of age	7·6	cases of infirmity,
„	30	„	13·0	„
„	40	„	30·1	„
„	50	„	77·0	„
„	60	„	260·0	„
„	65	„	461·0	„

and so on.

To this increase of the probability of infirmity according to age, is to be added, as already explained, the more rapid attainment in connection with the higher classes of age of the age of 70 required to obtain old age pension.

With a view of remedying the evil resulting in connection with the assurance institutions, East Prussia, and Lower Bavaria, the Bill constituting an appendix to the infirmity and old age assurance law submitted last year to the Imperial Parliament, but not passed, proposed a different distribution than at present of the pensions between the various assurance institutions after deduction of the State contribution. Every assurance institution, as well as every admitted special fund organization, should bear a fourth of the charge resulting from the pensions fixed (by it) for its district. The remaining three-fourths should be borne by all assurance institutions and admitted special funds organizations in common, and divided between them. Whether this artificial equalization may some day be introduced, is still doubtful; a more natural equalization would have been, in my opinion, the centralization of the infirmity and old age assurance, in such manner that all charges would be borne in common, and the assurance institutions only act as territorial executives. In this way, the present and sometimes troublesome disputes as to responsibility between the individual institutions would likewise be avoided.

With a view of collecting the contributions, the assurance institutions issue stamps bearing their value and the name of the relative institution. The same can be bought at the post-offices and also at certain special sale offices. The contributions of the employer and of the assured are to be paid by that employer who, first in the week, has employed the assured. In this connection the week (week of contribution) is, distinctly from the calendar week, reckoned from Monday.

The collection of contributions by means of stamps is one of the features of the infirmity and old age assurance which has been most attacked; nevertheless, the arrangement has so far shown itself to be the best. Particularly should the collection by way of addition to the income tax, which has been often suggested, be, in my opinion, absolutely discarded. In this case, the low-salaried agricultural labourers of the East, who, nevertheless, by the allowance of the most necessary things in kind, and the cheap living in the country, are much better off than the better paid industrial workers

living in the dear industrial centres, would, to a large extent, not share at all in bearing the costs of the assurance, in the advantages of which they share, whereas the official, gentleman, savant, who derive no advantage from the assurance, would have to bear the costs of it. This would no longer constitute assurance, but an assurance tax. Besides, the use of stamps, if effected punctually, is generally—leaving the large establishments out of account—not at all so troublesome as it would appear to be from the many hostile attacks, and the larger establishments referred to employ, as a rule, special officials entrusted with the duty of attending to the workman's assurance. An alleviation might also be effected through the issue, in addition to the stamps for weekly contributions, of larger stamps for the month, quarter, and year, in order that the use of stamps for those assured not paid by the week (servants, commercial clerks, officials, &c.), might be simplified.

The payment of the contributions is effected by sticking the stamps on the receipt card of the assured, at the time when the wages are being paid. An exception as to this takes place in connection with seafaring men and persons assured in special funds. The contributions of these persons are paid direct to the respective assurance institution or special fund, the assured receiving an acknowledgment thereof through the mariners' book or by special receipts. The employer may render the stamps valueless by marking thereon the date of use. The entry of an opinion as to the conduct or work of the assured or any other remarks, not provided for in the law, is prohibited and subject to penalty. The employer purchases the stamps out of his own means, and when paying the assured's wages deducts therefrom the one-half contribution to be borne by the latter.

The receipt card is, as a rule, issued gratuitously by the police authorities of the locality where the assured is employed or domiciled, and renewed by them when filled up, or to be exchanged, when lost or rendered unfit for use. Every receipt card bears at the top the name of the assurance institution in whose district the assured was employed when the first receipt card was issued. All receipt cards of the assured must therefore, regardless of the place of issue, bear the name of the same assurance institution. To that institution all cards, after exchange or renewal, are forwarded for the purpose of being kept; it follows that the last receipt card possessed by the assured, enables one to see what has become of all previous cards. The receipt card contains, apart from other things, the name and nationality of the assured, 56 (formerly 52) squares for affixing stamps, as well as space for recording illnesses entitling to sick pay, or military services. When exchanging full receipt cards, the assured receives, as voucher, a settlement certificate. As stated already, the employer may render the stamps valueless by noting thereon the date of their use, but he is not obliged to do so. In connection with voluntary assurance only, cancelment is prescribed. An obligatory cancelment of all stamps is, nevertheless, imperative, if an effectual checking of the use of the stamps is to be exercised. Such a checking may be dispensed with, when the collection of contributions is effected by sickness funds or other plans, as is often the case in Southern Germany (especially in Saxony).

It may be ordained by the State Central Authorities, or with their sanction, by statute of the assurance institution, or by statutory

regulation of the larger municipal union or a commune with the approval of the higher administrative authorities:

1. That the contributions for such assured as are members of a sickness fund, may be collected, through the officers of the latter on account of the assurance institution, from the employers, and that the stamps corresponding to the contributions collected be affixed on the receipt cards of the assured and cancelled.
2. That the contributions of such persons as are not members of a sickness fund, may be collected similarly through municipal authorities or other departments. In these cases, regulations respecting the obligation to notify admission and withdrawal of the assured may be enacted, and contraventions subjected to penalty; whereas, otherwise, obligations to notify admission and withdrawal of the assured do not exist.

The assurance institutions are obliged to place at the disposal of the sickness funds or the other departments authorized to collect contributions, the necessary stamps, subject to ultimate settlement, and to grant them a compensation which is fixed by the State Central Authorities. In the present instance, the sickness fund or special places may also be entrusted with the issue and exchange of the receipt cards.

The assurance institutions may, with the sanction of the State Assurance Department, issue controlling regulations, which is also done everywhere. The control which was intended, at first, to be solely established for the purpose of seeing to the regular use of the stamps, has been extended in so far that the inspectors are now mainly charged with the periodical inspection of the recipients of infirmity pensions, whereas the permanent inspection of the recipients of pensions is undertaken by the confidential men. The employers and assured are obliged to afford the inspectors every information with regard to the assurance relations. To a great extent, the administrative districts of the assurance institutions are divided into control districts, each being placed under the supervision of an inspector residing in the district.

Arrears, as well as the fines payable to the assurance institution, are collected in the same way as the municipal taxes. Arrears have a claim to priority in connection with bankruptcies.

The employers are prohibited from cancelling or limiting the application of the provisions of this law to the detriment of the assured, either by contract or working regulations.

To assured females who marry, as well as to the surviving widows and orphans of deceased assured persons, one-half of the contributions paid for the married female, or the deceased, may be refunded, provided the contributions, up to the time of marriage or death, have been paid for five years at least.

The repayment of the contributions to married females was not a specially happy idea, seeing that a large portion of the women, particularly those engaged in agriculture, continue to work after marriage, and must accordingly remain assured, although by repayment of the contributions effected prior to the marriage, they have lost the former reversion and must complete anew the time of probation.

With a view to greater security respecting the claims of the assured, the assurance institutions are obliged to accumulate a reserve fund, amounting to one-fifth of the capital value of the pensions, to be borne by the assurance institution during the first period of contribution. Besides, the assurance institutions may effect re-assurances, inasmuch as they may arrange to bear in common, either wholly or partially, the burdens of the infirmity and old age assurance.

The assurance institution may, in its own name, acquire rights and enter into obligations, it being represented judicially and extra-judicially by its Board of Direction. This Board has the character of a Public Department.

The funds of the assurance institution may not be employed for other purposes than are provided for in this law. The disposable moneys of the assurance institutions are to be invested safely as trust moneys. With the sanction of the municipal union or of the Central Authorities of the Federal State, in respect of which the assurance institution has been established, the assurance institution may invest its funds up to one-fourth in other securities bearing interest, or in landed property. By this regulation, the assurance institutions are afforded the means of carrying out a reproductive cultivation of the common weal, which, in fact, has been largely carried into effect, especially within the social field, by lending money towards the erection of artizans' dwellings, hospitals, or other buildings of public utility, to municipalities and other corporations.

The assurance institutions are obliged to forward to the Imperial Assurance Department, within certain fixed periods, accounts of their business and financial results. The financial year is the calendar year.

The assurance institutions are subject, in connection with the observance of the law, to supervision by the Imperial Assurance Department. All decisions of the Imperial Assurance Department are final, unless otherwise provided for in the law. The Imperial Assurance Department is empowered to undertake at any time an examination of the business management of the assurance institutions. The Imperial Assurance Department may at all times compel the Boards of Direction of the assurance institutions to comply with the legal and statutory provisions, and inflict fines in cases of non-compliance. In Federal States where State Assurance Departments are established, a portion of the functions of supervision of the Imperial Assurance Department is carried out by them.

For the district of every assurance institution, a State Commissioner is appointed to look after the interests of the other assurance institutions and of the State. This officer is empowered to assist at all deliberations of the officers of the assurance institution with consultative vote, as well as at those of all Courts of Arbitration, to submit proposals, to institute legal proceedings, and to inspect all documents. To this end due notice is to be given him of the subjects of deliberation. The functions of the State Commissioner extend also to those authorized special funds which have their head office within his district.

The obligation of municipalities or poor unions to assist indigent persons is not affected by this law.

All arbitrations and extra-judicial proceedings and documents, required to prove and settle the legal questions arising between the assurance institutions on the one hand, and the employers or assured on the other, are free of fees and stamps.

The public authorities are obliged to comply with the requests emanating from the Imperial Assurance Department, the State Assurance Departments, other public authorities, the Courts of Arbitration, as well as from the boards and officials of the assurance institutions and authorized special funds so far as they concern the execution of the law. The same obligation devolves upon the assurance institutions, the authorized special funds, the trade associations and the sickness funds to each other.

Contraventions of the provisions of the infirmity and old age assurance law are subject to penalty. The penalties are either determined by way of disciplinary penalties on the part of the institution board and lower administrative authorities, or by way of legal penalties on the part of the ordinary criminal courts.

Just as the whole workman's assurance, in general, the infirmity and old age assurance, in particular, has effected much in a sanitary direction, inasmuch as it has combined with these efforts a practical investment of funds. Not only have the assurance institutions lent money towards the erection of artizans' dwellings, and by this means gradually acquired influence in respect of the hygiene of dwellings; but the assurance institutions themselves have also taken the initiative, and rendered splendid service by establishing and granting subventions to consumptive hospitals, and where this has not been done, they have at least seen to it, that deserving patients be admitted into consumptive hospitals, in order that the care necessary to the cure, or at least alleviation of their sufferings might be bestowed upon them. Thus, the assurance institutions and authorized special funds have in the year 1897 provided special care for not less than 4,480 consumptive patients, and devoted thereto a sum of more than one million marks. In the front rank of these appear the assurance institutions "Hanse Towns" with 616, "Hanover" with 400, "Kingdom of Saxony" with 350, "Hesse-Nassau" with 280, "Thuringia" with 215, and "Brunswick" with 150, consumptive patients.

A means of affording, from the outset, proper treatment to diseased people is given by the law to the assurance institutions, in so far as they are empowered, in connection with diseases where, as a result, disability to work may be feared and, hence, a claim to infirmity pension be established, to undertake themselves the medical treatment to such an extent as it may be desirable, with a view to a rational cure of the disease, or to allow it to be undertaken by the sickness fund concerned.

Accordingly, the whole German workman's assurance and its executive bodies (sickness funds, trade associations, assurance institutions) are constantly endeavouring to improve the position of the workmen in a social and sanitary respect, to the benefit of internal peace, and the welfare of the German Empire, as well as to the glory of the founder of German workman's assurance, the late Emperor William I.

Kurze Auseinandersetzung des actuellen Zustandes der Begräbnisskassen und ähnlicher Instituten in Holland.

Von Dr. JUR. J. VAN SCHEVICHAVEN.

Holland gehört zu denjenigen Ländern, wo die Anzahl der *Begräbniss-* und *Krankenkassen* in Verhältniss zu der Bevölkerung des Landes am grössten erscheint. Schon im vorigen Jahrhundert gab es (neben den s. g. *Wittwenkassen*) Unternehmungen dieser Art, die aber durchwegs auf falscher, nicht wissenschaftlicher Grundlage ruhten und bei Dutzenden in die Brüche gingen. Leider hat sich derselbe Lauf der Dinge auch in unserem Jahrhundert noch öfters wahrnehmbar gemacht, ja noch heutzutage bestehen in *Holland* mehrere derartige "Kassen," die zwar grösstentheils *bona fide* gegründet wurden, nichtsdestoweniger aber zu Grunde gehen müssen, weil sie den Anforderungen der actuariellen Wissenschaft keine Rechnung tragen.

Seit nahezu zwei Dezennien tritt das Streben dem Treiben derartiger Unternehmungen ein Ende zu bereiten, in ausgeprägter Weise an den Tag. Es wird dabei aber oft die Sache selbst angegriffen statt der krankhaften Auswüchse derselben. Man hat nicht immer die Thatsache im Auge behalten, dass auf diesem Gebiet zwar Missbräuche vorkommen und Missstände zu beseitigen sind, dass aber die Wirkung dieser "Kassen" *im Allgemeinen eine segensreiche ist*, daher man dieselben nicht ohne Weiteres als Schwindel-Unternehmungen brandmarken darf.

Nur nachdem man sich durch genaue Untersuchung gänzlich bezüglich des actuellen Zustandes der Begräbnisskassen und Volksversicherungs-Gesellschaften informirt haben wird, kann an eine gründliche Umgestaltung der diesbezüglichen Verhältnisse gedacht werden. Diese Untersuchungen sind bereits soweit fortgeschritten, dass man sich über ihr Ergebniss einen einigermassen klaren Begriff bilden kann. Zweck dieser Zeilen ist es in *gedrängtester Form* dieses Ergebniss wieder zu geben.

Die ersten Schritte zur Sammlung des für die Untersuchung nothwendigen Materials wurden im Jahre 1885 von der *Niederländischen*

Lebensversicherungs-Gesellschaft[1] in Amsterdam unternommen. Dieselbe stellte eine Liste zusammen, welche die Namen und Gründungsjahre von 271 Begräbniss- und Krankenkassen enthielt. Nachdem bis dahin keine einzige Publication bestand, aus welcher man diese Daten hätte erfahren können, musste zum Zwecke der Ausstellung dieser Liste die Mitwirkung von nicht weniger als 1,100 Gemeinden in Anspruch genommen werden. Nur sehr wenige Kassen wurden dazu bereit gefunden, etwas mitzutheilen bezüglich ihres Geschäftsganges und des Ergebnisses des abgelaufenen Jahres. Die Direction der obengenannten Gesellschaft konnte diesbezüglich nur Nachstehendes publiciren:

" *Acht und dreissig* Kassen haben zusammen 960,267 Mitgleider.

" *Zehn* Kassen haben einen sämmtlichen Versicherungsstand in der " Höhe von fl. 6,552,063.

" *Drei und dreissig* Kassen haben einen Gesammtbesitz von " fl. 5,373,619.

" *Dreissig* Kassen haben eine gesammte Jahreseinnahme in der " Höhe von fl. 2,039,810.

" *Neun und zwanzig* Kassen verausgaben zusammen fl. 1,490,343.— " jährlich."

Es waren dies nur *sehr* unvollständige Angaben; sie hatten aber einen besonderen Werth, weil sie die ersten auf diesem Gebiete waren. Zwar hatte die Gesellschaft ein ziemlich ausführliches Material gesammelt, sie meinte aber mit vollem Rechte, " dass nur eine detaillirte " Untersuchung, mittels eines von der Regierung mit einer genügenden " Vollmacht ausgestatteten Komités, im Stande wäre das von ihr ange- " zündete Nachtlichtchen zu einem hellen Lichte anzufachen."

Die nächste Untersuchung wurde zwar nicht vom Staate, sondern von einem in *Holland* sehr verbreiteten Verein, dem " *Verein zur Beförderung* " *gemeinnütziger Zwecke*,"[2] unternommen. Es wurden ihr ansehnliche Ausgaben gespendet, und das Resultat derselben wurde im Jahre 1891 niedergelegt in einen Bericht des zu diesem Zwecke ernannten Komités.[3]

Die in diesem Berichte enthaltene *Liste der Begräbnisskassen* (Krankenkassen fielen ausserhalb des Untersuches) enthält 433 Nummern. Das 217 Seiten zählende Werk bildet eine hochbedeutsame Arbeit, die in einer kurzen Auseinandersetzung wie die vorliegende nur in sehr mangelhafter Weise gewürdigt werden kann. Um so bedeutender erscheint dieselbe, nachdem weder den Komité Mitgliedern noch dem obengenannten Verein selbst Mittel zur Verfügung standen, die Directoren oder sonstigen Vorsteher der Begräbnisskassen zur Mithilfe zu zwingen, und in einzelnen Theilen des Landes dem Verein gegenüber aus politisch-religiösen Rücksichten eine entschieden feindselige Stimmung besteht. Wir heben aus dem Berichte nachstehende Punkte hervor:

I. Es wurden in die Untersuchung einbezogen:

1. Begräbnisskassen	192
2. Begräbnisskassen, welche gleichzeitig Krankenkassen sind	170
3. An Arbeitervereinen verbundene Begräbnisskassen	12
4. An Arbeitervereinen verbundene Begräbnisskassen, welche gleichzeitig Krankenkassen sind	37
5. Unbekannt	22
	433

[1] " Algemeene Maatschappij van Levensverzekering en Lijfrente."
[2] " Maatschappij tot Nut van 't Algemeen."
[3] *De Begrafenisfondsen in Nederland.*—Rapport uitgebracht door de Commissie van

II. ZWECK dieser Vereine ist die Auszahlung einer bestimmten Summe im Todes- oder Krankheitsfalle. Auch Nebenzwecke werden verfolgt, wie:

1. Das Gewähren einer wöchentlichen Zulage an ältere Mitglieder (kommt vor bei 16 Kassen).
2. Das beërdigen selbst (kommt vor bei 9 Kassen).
3. Das Vermiethen von Traueranzügen, von Grundstücken, von Wohnungen.
4. Waffenübungen.
5. Das Veranstalten einer Jahresfeier, u.s.w.

III. Die *sub* I. erwähnten Kassen können, ihrer JURIDISCHEN NATUR nach, wie folgt in Gruppen getheilt werden:

1. Actiën-Gesellschaften	24[1]
2. Vereine, deren Rechtspersönlichkeit nach dem Gesetz vom 22 April 1855 (Staatsblatt No. 32) anerkannt ist	37[2]
3. Gegenseitigkeits-Gesellschaften, gegründet in Folge der königlichen Erlasse vom 16 Juli 1830 (St. bl. No. 54) und vom 2 Mai 1833 (St. bl. No. 15)	9
4. Gegenseitigkeits-Gesellschaften	250[3]
5. Verschiedene Formen	48
6. Unbekannt	65
	433

IV. Der UMFANG DES WIRKUNGSKREISES der Kassen geht hervor aus nachstehender Zusammenstellung:

1. Kassen, welche sich auf *eine* Gemeinde beschränken	275
2. Kassen, welche sich auf *eine* Provinz beschränken	3
3. Kassen, welche im ganzen Lande arbeiten	86
4. Unbekannt	69
	433

V. Nur von 247 Kassen lagen genügende Daten zur Beurtheilung ihrer FINANZIELLEN LAGE vor. Dieselben werden in drei Gruppen getheilt:

a. Kassen, deren finanzielle Lage günstig ist. Hierunter werden nur diejenigen Kassen gerechnet, bei welchen eine genaue Untersuchung nachstehender Punkte zu befriedigenden Resultaten führte:

1. Das Verhältniss zwischen dem Vermögen der betreffenden Kasse und ihrem Versicherungsstand, ihrer Prämieneinnahme und den von ihr vorgenommenen Auszahlungen, unter Berücksichtigung des Gründungsjahres.
2. Die Tarife und der Regiezuschlag, in Verbindung mit der Ziffer der Spesen.
3. Die Sterblichkeit nach Personen und Kapitalien.
4. Das Zunehmen oder Abnehmen der Anzahl der Mitglieder.

b. Kassen, deren finanzielle Lage ziemlich günstig ist. Zur Aufnahme einer Kasse in diese Gruppe gaben die nachstehenden Ursachen (vereinzelt oder combinirt) Anlass:

1. Unbegründete Abweichungen in den Prämien.

onderzoek, bestaande uit de Heeren Mr. W. L. P. A. Molengraaff, Dr. G. J. Legebeke en J. L. Huysinga. — Ouderkerk, M. E. de Grauw.

[1] Incl. die Lebensversicherungs-Gesellschaften, welche nebenbei eine Begräbnisskasse verwalten.

[2] Besonders die an Arbeitervereinen verbundenen Kassen fallen in diese Gruppe.

[3] In diese Gruppe fallen auch diejenigen Kassen, die Privat-Unternehmungen einer oder mehrerer Personen sind.

2. Zu hohe Spesen.
3. Grosse Sterblichkeit und demzufolge ansehnliche Auszahlungen.
4. Fortwährendes Abnehmen der Anzahl der Mitglieder.
5. Geringe Anzahl der Mitglieder und demzufolge geringe Ausdehnung und Wiederstandsfähigheit.
6. Neuliche Gründung; demzufolge Missverhältniss zwischen Einnahmen und Ausgaben und Ungewissheit bezüglich des zukünftigen Aufblühens.

Es wurde bei den in diese Gruppe fallenden Kassen aber besonders darauf Acht gegeben, dass das wirkliche Vermögen nicht *all* zusehr in Missverhältniss stehe—zu demjenigen das man erwarten dürfte.

c. Kassen, deren finanzielle Lage schlecht ist. Die nicht in die Gruppen *a* und *b* fallenden Kassen gehören in die Gruppe *c*. Es sind mehrere darunter, die beinahe nichts besitzen, oder deren Vermögen auch nicht annähernd übereinstimmt mit dem Versicherungsstand, der Prämieneinnahme und den Auszahlungen. Auch gehören hierzu einige neu-errichtete Kassen, deren Prämiensätze zu niedrig gestellt sind und deren Einrichtung entschieden missbilligt werden muss. Die 247 Kassen sind wie folgt über die drei Gruppen vertheilt:

—	Anzahl	Prozent	Anzahl der Mitglieder	Prozent	Versicherungsstand	Prozent
Gruppe I. Solide Kassen .	81	32·79	1,103,467	56·80	fl. 69,573,385	54·79
Gruppe II. Ziemlich solide Kassen	89	36·03	505,532	26·02	35,725,607	28·13
Gruppe III. Insolide Kassen .	77	31·18	333,717	17·18	21,690,463	17·08
Zusammen .	247	100	1,942,716	100	126,949,455	100

Der bei soliden und ziemlich soliden Kassen versicherte Betrag stellt sich also auf ungefähr 83 % des Gesammt Versicherungsstandes, daher der Zustand *im Allgemeinen* nicht ungünstig ist. Dennoch erscheint ein Betrag *ad* ungefähr 22 Millionen Gulden bei insoliden Kassen versichert. Wenn man die vielen Kassen, bezüglich deren finanzieller Lage kein Bericht erstattet wurde als insolide rechnet, erhebt sich dieser Betrag auf 23 Millionen. Alle diese obscuren Kassen zusammen haben also kaum eine Million Gulden Kapital versichert.

VI. Bezüglich der VERWALTUNGSVORSCHRIFTEN und VERSICHERUNGSBEDINGUNGEN kann Folgendes constatirt werden:

a. Die Statuten von 42 Kassen schweigen gänzlich über die *Verwaltung*. Bei 151 Kassen besteht ein Aufsichts-Komité in irgend welcher Form.

Bei 62 Kassen wird die Direction, bei 33 Kassen wird das Aufsichts-Komité durch Selbstwahl completirt.

Bei 292 Kassen ist die Direction rechenschaftspflichtig, u.z. entweder dem Aufsichts-Komité, oder den zu diesem Zwecke von der Direction selbst einberufenen Mitgliedern, oder auch der General-Versammlung der Mitglieder gegenüber.

Bei 15 Kassen ist ein "Buchhalter" oder "Administrateur" angestellt, der—je nachdem er selbst Mitglied der Direction ist oder nicht—seinen Collegen oder der Direction gegenüber rechenschaftspflichtig erscheint.

Die Statuten von 110 Kassen schweigen über das Honorarium der Directoren. 133 Kassen werden umsonst oder gegen eine Vergütung von weniger als fl. 50 verwaltet.

Bei 104 Kassen kann die Direction die Statuten abändern.

Bei 71 Kassen entscheidet die Direction oder das Aufsichts-Komité (oder auch beide) in allen Streitfragen.

Bei 26 Kassen entscheiden dieselben nur in Streitfragen, welche sich auf die Statuten beziehen.

b. Die *Prämienzahlung* bei denjenigen Kassen, welche auf Gegenseitigkeit gegründet sind, ist nach einem der nachstehenden Systeme geregelt:

1. Bei jedem Todesfalle zahlen alle Mitglieder einen festen Beitrag; es hängt somit die Höhe der Auszahlung von der Anzahl der Mitglieder ab.

2. Es werden diese Beiträge für einen oder zwei Todesfälle im Vorans entrichtet.

3. Die Mitglieder zahlen eine wöchentliche Prämie, und am Ende des Jahres wird die Kasse, entweder ganz oder bis zu einem bestimmten Minimum, unter die Mitglieder vertheilt.

4. Bei wöchentlichen Prämien werden die am Schluss des Jahres anwesenden Saldi aufbewahrt.

Die Prämien können in aussergewöhnlichen Umständen, wenn die Kasse nicht ausreicht, von der Direction erhöht werden, oder (falls der Direction diese Befugniss nicht ertheilt wird) es können unter solchen Umständen die aus zu zahlenden Beträge reducirt werden.

c. Rückkauf oder *Verabreichung einer prämienfreien Police* wird nur von *sehr* wenigen Kassen vorgenommen. Der Rückkaufswerth beträgt bei *einer* Kasse nach *fünf* Jahren 10% der eingezahlten Prämien, bei einer anderen nach *acht* Jahren fl. 15. Diejenigen Kassen, welche mit einer eigentlichen Lebensversicherungs-Gesellschaft verbunden sind, zahlen (wenigstens theilweise) einen Theil der Reserve als Rückkaufsumme aus, oder verabreichen eine prämienfreie Police unter Zugrundelegung der ganzen Reserve als einmalige Prämie

d. Umstände, welche die Kassen *von der Verpflichtung zur Auszahlung befreien* werden in manchen Statuten angeführt, u.z.:

1. *Selbstmord.* Obwohl es, besonders unter den kleineren Kassen, mehrere gibt, welche für den Selbstmordfall haften, schliesst die Mehrzahl das diesbezügliche Risico aus.

2. Ebenso in den meisten Fällen in welchen bei den eigentlichen Lebensversicherungs-Gesellschaften dieselben von der Verpflichtung zur Auszahlung befreit erscheinen. Es fallen hierunter u. A.: *Krieg Duell, Todestrafe, Tod durch eigenes Verschulden.*

3. Die Bestimmung, dass keine Auszahlung erfolgt, *wenn das Mitglied bei der Aufnahme krank war*, ist ziemlich allgemein.

4. Karakteristisch ist es, dass bei mehreren Kassen der Verlust der Mitgliedschaft die Strafe bildet für ein *unziemliches oder unverschämtes Auftreten der Direction oder den "Boten" gegenüber.*

5. Bei einer einzigen Kasse verfällt das Recht auf die versicherte Summe, "*in allen Fällen worin die Direction es aus wichtigen Gründen "nothwendig erachtet"* (*! !*)

Im Allgemeinen aber geben die Bedingungen, welche sich auf die Auszahlung beziehen, zu keinen ernsten Bedenken Anlass; die Coulance mehrerer Kassen kann dagegen mit Recht gelobt werden.

VII. Karakteristisch für die Begräbnisskassen ist das Botensystem. Die Klientel derselben recrutirt sich besonders aus den niederen Schichten der Bevölkerung, die in ungünstigen finanziellen Verhältnissen leben. Sogar die Aermsten, die die Ausgaben für die Mitgliederschaft einer Krankenkasse nicht erschwingen können, halten an der Mitgliedschaft ihrer Begräbnisskasse fest. Diese Leute zahlen ihre Prämien *wöchentlich*, und in Verbindung mit der geringen Höhe der Versicherungssummen werden diese Theilprämien äuszerst klein. Sie werden eingesammelt durch sog. "Boten." Solche Boten gehen wöchentlich von Haus zu Haus, nehmen 10, 20 und 50 Pfennige in Empfang, bisweilen sogar ohne eine Quittung darüber zu geben, und werden für das Einkassieren jeder Prämie mit einigen Pfennigen davon belohnt. Für die Anwerbung neuer Mitglieder erhalten sie eine etwas höhere Belohnung. Die Macht der Boten den Versicherten gegenüber ist ziemlich gross, besonders puncto Gewährung eines Aufschubs und Stornierung von Versicherungen (cf. über das Botensystem unten, *sub* IX, *b*)

VIII. Bezüglich der ärztlichen Untersuchung sind in der Hauptsache drei Methoden zu unterscheiden:

a. Die einfache *Erklärung des Boten*, dass sich die fragliche Person einer guten Gesundheit erfreut, genügt.

b. Es wird ein *Gesundheitsattest des Hausarztes* verlangt.

c. Es findet eine *oberflächliche Untersuchung* von einem dazu von der Kasse beauftragten Arzte statt.

Die *sub c* erwähnte Methode findet nur bei *sehr* wenigen Kassen Anwendung; es kann aber factisch von einem anständigen Boten, der kein neues Mitglied aufnehmen wird ohne es *gesehen* zu haben, oft eine viel schärfere Kontrolle geübt werden als von einem Arzte. Ausserdem lasten die Kosten einer ärztlichen Untersuchung viel zu schwer auf dem geringen Betrag der Prämieneinnahme.

IX. Missstände oder als solche bezeichnete Zustände.

a. Willkür der Directoren. Diese kommt hauptsächlich vor bei denjenigen Kassen, welche auf Gegenseitigkeit gegründet sind. Es gibt deren zwar einerseits sehr viele, welche nach democratischen Grundsätzen verwaltet werden, andererseits aber mehrere, bei denen der Absolutismus das Wort ist. Diejenigen, welche als Privat-Unternehmungen der Directoren bezeichnet werden können, gehören gewöhnlich zur letzteren Kategorie. Bei sehr vielen, und darunter grösseren Begräbnisskassen erscheinen die Klagen bezüglich der Willkür der

Direction wohlbegründet besonders puncto Stornierungen (cf. hierzu oben, *sub* VI., *a*).

b. Willkür der Boten. Nachdem dem Boten den Versicherten gegenüber eine bedeutende Macht zusteht (cf. oben, *sub* VII.), hat er auch Gelegenheit mit seiner Befugniss Missbrauch zu treiben, und das geschieht auch bisweilen; willkürliche und ungerechtfertigte Stornierungen zum Nachtheil der Versicherten sind nicht selten. Das Hinüberziehen von Mitgliedern von einer Kasse zur anderen, um aufs neue das Anwerbegeld zu erhalten, findet häufig durch vertrauensunwürdige Boten statt und geht gepaart mit vielen Stornierungen zum Schaden der ersten Kasse. Gewöhnlich wissen die Mitglieder von Begräbnisskassen nicht einmal, von *welcher* Kasse sie Mitglied sind, sondern betrachten sich als versichert bei ihrem Boten. Dieser spricht denn auch oft, ohne Umstände, von *seinen* Mitgliedern; in Annoncen bietet er sie nicht selten "zum Kauf" an, kurz er betrachtet alle Versicherungen als sein spezielles Eigenthum und verleugnet dabei die Verwalter seiner Kasse.

Man hüte sich aber davor, die hier beschriebene Handlungsweise als das *gewöhnliche* Vorgehen der Boten zu betrachten. Viele derselben gehen mit wahrer Menschenfreundlichkeit zu Werke, und es ist keine Seltenheit, einen Boten aus eigenen Mitteln die Beiträge vorschiessen zu sehen, um einer armen, fleissigen Familie aus der Patsche zu helfen.

c. Incoulance bei Auszahlungen. Obwohl von gewisser Seite hierüber Klage geführt wurde, hat die Untersuchung derartige Fälle nur äusserst selten ans Licht gebracht. Es hat sich also nicht herausgestellt, dass diese Incoulance oft vorkommt. Besonders bei den kleineren Kassen, welche ihre Wirksamkeit auf eine einzige Gemeinde beschränken und bei Arbeiterkassen ist sie gänzlich unbekannt.

d. Die Aufnahme von Mitgliedern durch Vermittlung Dritter, die damit einen Gewinn zu erreichen hoffen. Die hierüber angeführten Beschwerden erachtet das Komité stark übertrieben. Zwar kommt oft gleichzeitige Theilnahme in zwei oder mehreren Kassen vor, aber insoweit damit nur eine Erhöhung der im Todesfalle auszuzahlenden Summe bezweckt wird, liegt darin nichts bedenkliches. Im Gegentheil, es nähert sich diese Versicherungsart derjenigen, welche von den eigentlichen Lebensversicherungs-Gesellschaften bezweckt wird. Nur die Versicherung *eines Kindes* bei mehreren Kassen erachtet das Komité nicht ohne Bedenken (cf. unten, *sub g*).

e. Zu hohe Prämien. Dieser Vorwurf ist nicht gerechtfertigt. Zwar zahlen die Mitglieder eine verhältnissmässig hohe Prämie; *zu* hoch ist dieselbe aber in den meisten Fällen nicht. Es müssen eben die Prämien der Begräbnisskassen verhältnissmässig hoch sein:

1. Weil die Entlohnung der Boten in Verhältniss zu den von ihnen einzukassirenden kleinen Beiträgen hoch ist und sein *muss*.

2. Weil alle Ausgaben und Auszahlungen die finanzielle Lage der kleineren Kassen stark beeinflussen.

3. Weil viele Mitglieder ihre Versicherungen *sehr* bald zum Storno bringen, bevor die auf ihre Anwerbung gespendeten Kosten eingebracht sind.

f. Die Begräbnisskassen ruhen nicht auf wissenschaftlicher Grundlage. Leider sind die Vorwürfe, welche man in dieser Hinsicht den Begräbniss-

kassen macht, nur zu wohl begründet. Die Hauptursache des in dieser Hinsicht traurigen Zustandes ist *Unwissenheit*, d. h. Unbekanntheit mit den Erfordernissen der Lebensversicherungs-Wissenschaft. Es wird oft und schwer gesündigt, aber nicht in böser Absicht. Im Allgemeinen verstehen die Directoren und Verwaltungsräthe der Kassen nicht, dass es unumgänglich nothwendig ist die Hülfe der Wissenschaft in Anspruch zu nehmen. Es gibt sogar viele Beispiele von Kassen, die, nachdem sie zu einer grossen Blüthe gelangt, zu Grunde gerichtet werden durch eine, infolge des günstigen finanziellen Zustandes, vorgenommene Erhöhung der auszuzahlenden Beträge, die viel zu ansehnlich und mit den Regeln der Wissenschaft keineswegs in Einklang sind. Anderseits gibt es Beispiele von Kassen, die einen viel zu ansehnlichen Betrag reserviren, und dennoch mit hohen Prämien weiter arbeiten; die Anzahl der Mitglieder bleibt dann stationär, oder nimmt sogar ab, und die Kasse vermag sich nicht zu einer gewissen Blüthe empor zu schwingen.

Die Aufgabe des zukünftigen Gesetzgebers wird es in erster Linie sein, die Begräbnisskassen zu einer wissenschaftlichen Verwaltung zu zwingen.

g. Die Begräbnisskassen beeinflussen die Kindersterblichkeit in ungünstigem Sinne. Zwei Umstände geben Anlass zu diesem Vorwurf:

1. Es können Kinder, indem man sie bei mehreren Kassen versichert, oft zwei-, drei- und mehrfach versichert erscheinen (cf. oben, *sub d*).

2. Mehrere—besonders grössere—Kassen haben das System der "*freien Auszahlungen*" eingeführt, d. h., wenn die Eltern versichert sind, gelangt auch bei dem Tode eines Kindes eine kleine Summe (gewöhnlich unter fl. 10) zur Auszahlung, *ohne dass dafür Prämie gezahlt zu werden braucht.* Ein von der "Niederländischen Gesellschaft zur Beförderung der Heilkunde"[1] ernanntes Komité äusserte sich diesbezüglich wie folgt: "Das System der 'freien Auszahlung' . . . übt auf "die Eltern einen demoralisirenden und in sehr vielen Gemeinden "unseres Landes einen sehr traurigen Einfluss auf die Kindersterblichkeit, "besonders unter den Kindern, welche das erste Lebensjahr noch "nicht vollendet haben."

Nachstehende Tabelle gibt einen Ueberblick über die Sterblichkeit bei den Kassen im Allgemeinen und bei denjenigen *mit* und *ohne* "freie Auszahlung" im Besonderen:

—	Anzahl der Mitglieder	Jährliche Sterbefälle	Sterbeprozent	Versicherungs Stand	Auszahlungen	Auszahlungsprozent
174 Kassen *ohne* "freie Auszahlung" . .	811,285	13,215	1·63	fl. 55,190,986	fl. 743,851	1·35
22 Kassen *mit* "freier Auszahlung" . .	1,004,200	28,513	2·84	53,414,000	934,373	1·75
Zusammen . .	1,815,485	41,728	2·30	108,604,986	1,678,224	1·545

[1] 'Nederlandsche Maatschappij tot bevordering der Geneeskunst."

Die grössere Sterblichkeit in der zweiten Gruppe findet ihre Erklärung in dem Umstande, dass bei diesen Kassen *mit* " freier Auszahlung " verhältnissmässig mehr *sehr junge* Kinder versichert sind, worunter so wie so schon eine grosse Sterblichkeit herrscht.

Die Frage geht nun dahin, ob diese Sterblichkeit wirklich durch das System der " freien Auszahlungen " gefördert wird.

Das Komité äussert sich dahin, dass es nicht nachweisbar ist, dass die eingebrachten Beschuldigungen jedes Grundes entbehren. Es glaubt, dass in der That die Versicherungen auf das Leben von Kindern Anlass zu traurigen Missbräuchen geben, obwohl es den Ausspruch, dass durch dieselben ein Preis für " verkappten Kindermord " angeboten wird, als übertrieben kennzeichnet. Der Zustand scheint dem Komité derart ernst, dass man sich damit nicht zufrieden geben darf; gesetzliche Vorschriften sollen ins Leben gerufen werden, damit dem Uebel gründlich entgegen getreten werde.

X. Zum Schluss entnehmen wir dem Bericht einige Ziffern, woraus der Umfang der Operationen der Begräbnisskassen hervorgeht:

Die Hälfte der ganzen Bevölkerung (also ± 2,250,000 auf 4,500,000) ist bei irgend welcher Begräbnisskasse versichert, und zwar im Durchschnitt für einen Betrag von *sechzig Gulden* pro Kopf, also für einen Gesammtbetrag von circa *hundert ein und dreissig Millionen Gulden.*

Durch sämmtliche Versicherten wird jährlich ein Betrag von *mehr als* 4,100,000 *Gulden als Prämie* eingezahlt.

Die Begräbnisskassen zahlen jährlich in circa 50,000 *Todesfällen* einen Gesammtbetrag von *mehr als* 2,000,000 *Gulden.*

Der Gesammtbetrag der *jährlichen Unkosten* stellt sich auf *mehr als* 1,400,000 *Gulden.*

Das *Gesammtvermögen* der Begräbnisskassen beträgt circa *zwölf und eine halbe Million Gulden.*

Die *Gesammteinnahmen* stellen sich auf *mehr als* 4,500,000 *Gulden.*

Hiermit erscheint der Inhalt des überaus reichhaltigen Berichtes kürzlich beleuchtet. Derselbe wird für die Kenntniss der holländischen Zustände auf diesem Gebiet immer eine der Hauptquellen bleiben.

Eine zweite Hauptquelle dafür danken wir dem *Staats-Komité für die Arbeiter Enquête*, das in seiner Versammlung vom 6^{en} Mai, 1890, seiner *Ersten Abtheilung* den Auftrag ertheilte, eine Untersuchung vorzunehmen bezüglich der Versicherung und anderer Versorgungsmassregeln für Arbeiter bei Unfällen, Krankheit, Ableben oder vorgeschrittenem Alter, in so weit diese Massregeln nicht mit bestimmten industriellen Einrichtungen in Verbindung stehen."

In zweierlei Hinsicht unterschied sich die Aufgabe dieser Ersten Abtheilung des Staats-Komités von derjenigen des von dem " Verein zur Beförderung gemeinnütziger Zwecke " ernannten Komités:

1. Ihre Aufgabe bezog sich nicht nur auf die *Begräbnisskassen*, sondern auf die *Krankenkassen*, *Invaliditätsversicherungen*, u.s.w., mit einem Worte auf alle Unterstützungs- und Versicherungskassen.

2. Zweck der Untersuchung war nicht das Erwerben genauer Kenntnisse bezüglich *des Zustandes* und *der Wirkung* der Begräbnisskassen, sondern bezüglich des gesellschaftlichen Zustandes der Arbeiter in Bezug auf die bestehenden Unterstützungs- und Versicherungskassen.

Es standen also nicht die Kassen selbst, sondern es stand die Wirkung derselben auf die Arbeiterfamilien im Vordergrunde.

In December, 1892, veröffentlichte die in Frage stehende Abtheilung[1] des Staats-Komités einen ausführlichen *Bericht*, begleitet von mehreren *Beilagen* und von einem wortgetreuen *Protokoll aller angestellten Zeugenverhöre* (es wurden 353 Zeugen vorgeladen, denen insgesammt 17,159 Fragen gestellt wurden). Es ist dies eine Riesenarbeit, die nicht weniger als 1,370 Folio-Seiten ausfüllt und auf jeder Seite die Spuren eines zielbewussten, scharfkritischen und menschenfreundlichen Geistes trägt.

Eine Uebersicht dieser Arbeit zu liefern ist—sogar in gedrängtester Form—nicht ausführbar. Es wurden 840 *Vereine* in die Untersuchung einbezogen, u. z.:

1. Die *Krankenkassen.*
2. Die *Begräbnisskassen.*
3. Die *Kranken- und Begräbnisskassen.*
4. Die *Lebensversicherungs-Gesellschaften*, welche Versicherungen unter fl. 300 abschliessen.
5. *Pensions-* und *Wittwenkassen* oder *-Vereine.*

Im Allgemeinen wird die Wirkung derselben als segensreich und für die Arbeiterklassen als wohlthätig bezeichnet. Sie heben das Gefühl der Zusammengehörigkeit und fördern die freundschaftlichen und brüderlichen Beziehungen der Arbeiter unter einander.

Die beiden grossen Prinzipiën, worauf die Mehrzahl dieser Kassen ruht, sind die *Selbsthilfe*, und daneben die *Coöperation.* "Heute ich für dich, morgen du für mich" könnte ihr Wahlspruch sein.

Ueberdies spielt oft die *Philanthropie* eine Rolle: dankbar nehmen die Kassen oder Vereine diejenigen Gaben entgegen, welche der Arbeiter *für sich selbst* nicht gerne verlangt. Auch werden viele Kassen begründet und verwaltet von uneigennützigen Menschenfreunden, die im Interesse des Arbeiters ihr Geld und ihre Zeit opfern. In dieser Hinsicht sind besonders hervorzuheben die Kassen, welche in mehreren Theilen des Landes von dem "Verein zur Beförderung gemeinnütziger "Zwecke" gegründet wurden.

Diesen philanthropischen Bestrebungen stehen die Beweggründe nahe, welche viele Firmen dazu veranlassen an die Gründung und das Instandhalten von *Fabrikskassen* mitzuwirken. Nach diesem Muster haben sich aber auch andere, *nicht* an bestimmten industriellen Einrichtungen verbundene (d. h. *freie*) Kassen gebildet, was Anlass gegeben hat zu Uebertreibungen hinsichtlich der Befugnisse der Verwalter.

Auch die von *kirchlichen Armen-Behörden* ("Kerkelijk Armbestuur") unterstützten Kassen stehen der Philanthropie nahe, wie auch diejenigen, die von den *Armen-Behörden irgend welcher Gemeinde* ("Gemeentelijk" oder "burgerlijk Armbestuur") unterstützt und gänzlich oder theilweise verwaltet werden.

Zum Schluss tritt bei vielen Kassen das *Unternehmersprinzip* in den Vordergrund. Schon der Arzt, der für die Arbeiterklasse die Gelegenheit eröffnet sich mittels Zahlung einer geringen, aber regelmässigen Contribution für die ärztliche Behandlung zu abonniren, ist Unternehmer: Gewinn und Verlust sind für seine Privatrechnung und es steht ihm

[1] Mitglieder dieser Abtheilung waren die Herren: Jhr. Dr. W. F Rochussen (Präsident), J. P. de Bordes, J. F. Jansen, und S. M. van Wijch.

frei nach eigener Wahl Theilnehmer aufzunehmen oder abzuweisen. Sehr bemerkenswerth ist diesbezüglich nachstehende Aeusserung :

" Grosse Krankenkassen erfordern in erster Linie eine in technischer " und finanzieller Hinsicht vorsichtige und krättige Verwaltung. Die " Lebensversicherung hat ihre sehr abwechselnden Chancen, besonders " in den Händen wohlmeinender Dilettanten. Es ist zweifellos, dass der " Theilnehmer in manchen Fällen, sowohl für die ärztliche Behandlung " als für die Ablebensversicherung, *am besten und am solidesten geholfen* " *wird von denjenigen Personen, die daraus einen gewinnergebenden Betrieb* " *machen.*[1] Vom Standpunkt der Volkswohlfahrt aus kann dagegen " also keine Beschwerde erhoben werden, vorausgesetzt, dass das " Unternehmen auf einer Grundlage ruht, die wirklich eine genügende " Sicherheit bietet, *und dass es sein Charakter als Betrieb nicht hinter der* " *Maske einer gegenseitigen Hülfeleistung versteckt.*" [1]

Es sollten diese Worte den aufsichtsbegierigen Gesetzgebern des Continents, die es gerade auf die das Lebensversicherungsfach *als Betrieb* ausübenden Gesellschaften abgesehen haben, unauslöschlich ins Gemüth geprägt werden.

Selbstverständlich erscheint es, dass der Bericht des von dem " Verein zur Beförderung gemeinnütziger Zwecke " ernannten Komités eine der Hauptstützen des Enquête-Komités bei seiner Arbeit war. Zu wiederholten Malen werden die ausserordentlichen Verdienste dieses Berichtes hervorgehoben, und die Sorgfalt, welche bei der Zusammenstellung desselben angewendet wurde, wird öfters gelobt. Dennoch ist das Urtheil des Enquête-Komités in einer wichtigen Frage verschieden von demjenigen des früheren Komités, u. z. bezüglich der *Kindersterblichkeit* (cf. oben, IX. *sub g*). Unseres Erachtens geht—besonders für den aufmerksamen Leser der Protokolle über die angestellten Verhöre—aus der Enquête sonnenklar hervor, dass die düsteren Beschuldigungen, denen sogar das frühere Untersuchungs-Komité noch eine so grosse Bedeutung beilegte, allein auf " Hörensagen " beruhten, und dass sie einer dem anderen, wenn auch in gutem Glauben, nachsprach. Fast einstimmig war über diesen Punkt das Urtheil sowohl der Aerzte, als auch der Begräbnisskassenverwaltungen, als auch der Versicherten selbst. Nicht allein, dass kein einziges Beispiel von Verwahrlosung und schlechter Behandlung von Kindern wegen der zu empfangenden Auszahlung angeführt werden konnte, es ergab sich sogar, dass im allgemeinen die Behandlung der Kinder in den niederen Ständen eine ausgezeichnete ist, immer ausgezeichnet, so weit es die allerdings oft sehr dürftigen Verhältnisse der Eltern zulassen. Was man dem Kinde gutes thun *kann*, geschieht; und selbst in Fällen der Noth sparen sich die Eltern das Brod für die Kinder buchstäblich am Munde ab, u. z. ohne Unterschied, ob beim Tode der Kinder eine Auszahlung stattfindet oder nicht. Anstatt traurige Geheimnisse zu enthüllen, hat also die Enquête die Thatsache ans Licht gebracht, dass der niederländische Arbeiter zu hoch steht, um das Leben seines Kindes um weniger Gulden willen muthwillig zu opfern. Es gewährt eine grosse Genugthuung, dass man dies jetzt mit gutem Grunde behaupten kann, ohne Gefahr zu laufen, für zu optimistisch gehalten zu werden.

Vor circa einem Jahre wurde in Holland von dem zu diesem Zweck-

[1] Wir cursiviren.

ernannten Staats-Komité[1] der Entwurf zu einem Gesetz auf den Betrieb der Lebensversicherung publicirt.

Dieser Entwurf behandelt gleichzeitig Lebensversicherungs-Gesellschaften und Begräbnisskassen (und ähnliche Institute), daher die Einheit desselben verloren gegangen und eine bunte Mischung von Vorschriften, welche sich theilweise auf das eine, theilweise auf das andere, theilweise auch auf beide Institute beziehen, entstanden ist.

Die Missstände, welche bei mehreren Begräbnisskassen constatirt wurden, werden von dem Komité vorgestellt als auf die Lebensversicherung im Allgemeinen Bezug habend, was den Lebensversicherungs-Gesellschaften gegenüber ein grosses Unrecht ist. Im Gegensatz zu den wohlbegründeten Anschauungen des Enquête-Komités[2] werden die Gefahren bezüglich einer Zunahme der Kindersterblichkeit breit ausgemessen, und werden diejenigen Gesellschaften, die aus dem Abschluss von Versicherungen einen gewinnbringenden Betrieb machen, als die natürlichen Feinde der Versicherten betrachtet und als solche behandelt.

Diese falschen Auffassungen gaben Anlass zu dem Vorschlag, eine strenge, arbiträre, in die Verwaltung von Begräbnisskassen und Lebensversicherungs-Gesellschaften tief hineingreifende *Staatsaufsicht*, mittels unverantwortlicher und wahrscheinlich dazu nicht befähigter Staatsbeamten, einzuführen.

Die allgemeine Opposition, welche dieser Entwurf—der übrigens eingereicht wurde mit völliger Ignorirung der Versicherungspraktiker—ins Leben gerufen hat, gibt Anlass zu der begründeten Hoffnung, dass derselbe nie zum Gesetz erhoben werden wird, und dass man auch in Holland dem einzigen System huldigen wird, das sich bis jetzt in der Gesetzgebung in jeder Hinsicht bewährt hat: dem englischen System der zwangsweisen *Oeffentlichkeit*, verbunden mit der *Freiheit* des Betriebes.

[1] Präsident dieses Komités war der ehemalige Präsident des von dem Verein zur Beförderung gemeinnütziger Zwecke ernannten Komités, Prof. Molengraaff; Mitglieder waren: Dr. Bolle, Dr. Simons, Prof. van Geer und Schuylenburg.

[2] Cf. oben, Seite 11.

Translation.

Short exposition of the actual condition of Burial Clubs, and analogous Institutions, in Holland. *By* J. Van Schevichaven, D.LL.

Holland is among the countries in which the number of burial clubs and sickness benefit societies, appears to be the greatest proportionately to the population. As early as the 18th century there were to be found, in addition to the so-called widows' funds, undertakings of the nature in question, which, however, being established upon altogether erroneous and unscientific bases, went to pieces by the dozen. The same state of things has, unfortunately, also presented itself in the present century, and even at this day, there are to be found in Holland several "funds" of the type referred to, which, although for the most part established *bonâ fide*, must nevertheless come to the ground, because they do not take account of the claims of actuarial science.

Well-marked efforts were manifested about 20 years ago to make an end of such undertakings. But the thing itself was often attacked instead of its feeble off-shoots.

The fact has not always been kept in view that such concerns afford room for abuses, and that misconceptions require to be removed; while on the other hand, these "funds" are, *in general*, a source of blessing, so that one ought not to stigmatize them indiscriminately as swindles.

It is only when one has fully informed oneself, by means of a rigid investigation into the exact financial condition of these burial clubs and friendly societies, that one can suggest any radical changes in them. Such an investigation has already proceeded so far, that we are enabled to form an opinion to some extent, as to its results. The object of this paper is to give the concisest possible account of such results.

The first steps towards collecting the necessary materials for the investigation was taken in the year 1885, by the *General Life Office* of Amsterdam.* This office drew up a list giving the names and dates of establishment of 271 burial clubs and sickness benefit societies. Inasmuch as up till then no single publication existed from which these data could be obtained, the compilation of this list made it necessary to apply for the co-operation of no less than 1,100 parishes.

Only a few funds were prepared to give information respecting the progress of their business and the results of past years. The above-mentioned company was enabled to publish only the following particulars on this subject:

" Thirty-eight funds comprised in all 960,267 members.

* "Algemeene Maatschappij Van Levensverzekering en Lijfrente."

" Ten funds had on their books assurances for the total sum of " Fl.6,552,063.

" Thirty-three funds possessed assets amounting together to " Fl.5,373,619.

" Thirty funds had an aggregate income of Fl.2,039,810.

" Twenty-nine funds paid away in a year the total of " Fl.1,490,343."

The statistics were thus *very* defective. They had, however, a certain value, as being the first that had been collected of their kind. While it was true that the company had brought together fairly detailed materials, they rightly concluded that "nothing short of a " detailed investigation by commission, clothed by the Government " with the necessary powers, would be able to kindle into a bright " flame the night-light to which they (the company) had set a " match."

The next investigation was, however, undertaken, not by the State, but by a widespread Dutch society, "The Society for Promoting Objects of Public Utility."* After a considerable expenditure, the results of the investigation were published, in the year 1891, in the form of a report of the committee appointed for the purpose.†

The list of burial clubs given in this report (sickness benefit societies did not fall within the purview of the investigation) contained 433 numbers. The report, running to a volume of 217 pages, constitutes a work of great importance, to which, in a brief analysis like the present, but very imperfect justice can be done. This work appears all the more noteworthy when it is remembered that neither the members of the committee, nor the aforesaid company itself, had any means of compelling the managers or other officers of the burial clubs to afford them assistance, while, in certain parts of the country, a politico-religious feeling, decidedly opposed to the society, manifested itself.

We extract the following points from the report :—

I. There were included in the investigation—

(*a*) 192 burial clubs, pure and simple.
(*b*) 170 burial clubs which gave sickness benefits.
(*c*) 12 burial clubs combined with workmen's clubs.
(*d*) 37 burial clubs so combined, and also paying sickness benefits.
(*e*) 22 undefined societies.

II. The main purpose of these societies is to pay a definite sum at death or in the case of sickness.

The following subordinate objects are aimed at:—

(*a*) To provide a weekly allowance to the older members. (This a feature in the case of 16 funds.)
(*b*) Burial itself. (9 societies provide this.)

* "Maatschappij tot Nut van 'l Algemeen."

† *De Begrafenisfondsen in Nederland.*—Rapport uitgebracht door de Commissie van onderzoek, bestaande uit de Heeren, Mr. W. L. P. A. Molengraaff, Dr. G. J. Legebeke, J. Huysinga-Ouderkerk, M. E. de Grauw.

(*c*) Lending of mourning apparel, and letting of plots of ground and dwellings.
(*d*) Military exercises.
(*e*) Arranging for annual festivities, and so forth.

III. The societies comprised under heading I. can be grouped according to their legal nature, as follows:—

1. Joint-stock companies	24
2. Societies incorporated under the law of 22 April 1855 (Law No. 32)	37
3. Mutual societies founded under the Royal Decrees of 16 July 1830 (Law No. 54) and 2 May 1833 (Law No. 15)	9
4. Mutual societies	250
5. Various „	48
6. Undefined „	65
	433

IV. The societies may be grouped according to territorial limits as under:—

1. Societies, the operation of which are restricted to their parishes	275
2. Societies which do not extend beyond their respective provinces	3
3. Societies extending their operations over the whole country	86
4. Societies of which the limits are undefined . .	69
	433

V. There are only 247 cases in which data are available sufficient to support conclusions respecting the financial condition of the societies.

These 247 cases may be divided under three heads:

(*a*) *Societies, the financial condition of which is good.*

Under this head are placed those funds alone which satisfy a strict investigation on the following points:—

1. The ratios of the assets of the society to its insurances, its premium income, and its outgo for the year of investigation.
2. The premium tables and loading in relation to the actual rate of management charges.
3. The death rates according to individuals and sums assured.
4. The increase or decrease in the number of members.

(*b*) *Societies, the financial condition of which is fairly good.*

A society was placed in this group if it presented one or more of the undermentioned features:—

1. Unjustifiable departures in its premium rates from a known standard.

2. Too high expenditure.
3. High mortality and, consequently, heavy claims.
4. Continual decline in the number of members.
5. Insufficiency in the number of its members, and consequent inability to withstand fluctuations.
6. Recent establishment, and resulting disproportion between income and outgo, with uncertainty as to future development.

In the case of societies falling under this head, particular care has been taken lest the actual assets should differ too widely from what would be properly looked for.

(*c*) *Societies, of which the financial condition is bad.*

Societies which cannot be placed in groups *a* and *b* fall under head *c*. There are several of these which possess hardly any assets at all, or of which the funds are out of all proportion small in comparison with the amount of their risks, their premium income, and their payments. Under this head, too, are to be found some newly-established "funds", the premium rates of which are fixed too low, and the management of which must certainly be viewed with disapproval.

The 247 funds are distributed among the three groups as follows:

Number		Percentage of Whole	Number of Members	Percentage of Whole	Amount of Risks	Percentage of Whole
Group I. (condition excellent)	81	32·79	1,103,467	56·80	fl. 69,573,385	54·79
Group II. (condition fair)	89	36·03	505,532	26·02	fl. 35,725,607	28·13
Group III. (condition bad)	77	31·18	333,717	17·18	fl. 21,690,463	17·08
Total . .	247	100·00	1,942,716	100·00	fl. 126,989,455	100·00

The sums assured by the societies constituting groups I. and II., amount, therefore, to about 83 per-cent of the whole, and, *in general*, therefore, the societies are not in an unsatisfactory condition. Nevertheless, there appears to be an amount of something like 22 millions of gulden insured by unsound societies. When one treats as unsound a number of societies which render no report as to their financial condition, the 22 millions must be increased to 23. So that all these last-mentioned obscure societies have insured together hardly one million gulden.

VI. With regard to the administration and conditions of assurance, the following can be stated:

(*a*) The rules of 42 funds are wholly silent respecting their administration. In the case of 151 societies, there is a committee of superintendence in some form or

another. In the case of 62 societies, the management, and in the case of 33 the committee, have the power of electing to vacancies in their number.

In the case of 292 societies, the management is answerable either to the committee or to members appointed for the purpose by the management itself, or, further, to the members in general meeting. A "book-keeper" or "administrator" is appointed in the case of 15 societies, who, if a member of the board of directors, appears to be responsible to his colleagues, if not, to the board.

The rules of 110 societies are silent as to the directors' fee.

133 funds are managed either by volunteers or at a cost of less than Fl.50.

In the case of 104 funds, the directors can vary the rules.

In the case of 71 funds, disputes are settled by the directors, or the committee of management, or both.

In the case of 26, they have only power to settle questions which arise on the construction of the rules.

(*b*) The premium payments in those societies which are founded on the mutual system, are regulated according to one of the following systems:

1. At every death each member pays a fixed amount; the total sum paid out depends, therefore, upon the number of the members.
2. These contributions are paid in advance for one or two deaths.
3. The members pay a weekly premium, and at the end of the year the fund is divided among the members either wholly, or up to a fixed minimum.
4. In the case of weekly premiums the payments in hand at the end of the year are retained.
5. The premiums can, under exceptional circumstances, if the fund is deficient, be raised by the management, or (in case the board are not empowered to do this) the sums assured can under such circumstances be reduced.

(*c*) *The surrender* of a paid-up policy is allowed by only *very* few societies. The surrender-value amounts in one society, after five years, to 10 per-cent of the premiums paid. In another, after eight years, to Fl.15. Those funds which are associated with a real life insurance office pay (at least, occasionally) a part of the reserve as surrender value, or grant a paid-up policy on the basis of applying the whole reserve as a single premium.

(*d*) The conditions under which societies are freed from liability to pay are laid down in many rules. As—

1. *Suicide.*—Although there are some societies, especially the smaller ones, which undertake risk of suicide, most exclude it.
2. In like manner, the events which in ordinary life offices work forfeiture also relieve these societies, such as war, duelling, capital punishment, death of the assured through his own fault.

3. The proviso that there is no liability if the member was in ill-health at the time of the acceptance of the proposal, is pretty general.
4. It is characteristic of some burial clubs, that loss of membership is the punishment for *unbecoming* or *shameless* appearance before the board or the "collector."
5. In one single society the right to the assured sum is liable to be forfeited "*in all cases in which for weighty reasons the board of directors think such forfeiture necessary*"!!

In general, however, the conditions touching the payment of claims give cause for no serious consideration. The liberality of several societies, on the contrary, can be greatly praised.

VII.—One of the features of these societies is the collector system. The body of members is recruited mainly from the lower classes of the population, who live in unfavourable financial circumstances. Even the poorest, who cannot afford the contributions towards membership of a sickness society, cling to their membership of the burial club. Such people pay their premiums *weekly*, and, in correspondence with the diminutive amount of the assured sum, the fractional premium will be extremely small. They are collected by the so-called "collector"; such collectors go weekly from house to house, receive payment of 10, 20, and 50 cents, sometimes even without giving a receipt, and are remunerated with some cents for every premium collected. For securing new members the collectors receive a somewhat higher remuneration. The power of the collectors as regards the assured is pretty considerable, especially in the matter of giving grace, and lapsing of insurances. (*cf.* concerning the collector-system below, under IX, *b*.)

VIII.—With regard to the medical examination, there are, in the main, three methods to be distinguished.

(*a*) The simple declaration of the collector, that the individual in question enjoys good health, is sufficient.

(*b*) A certificate is required from the family doctor.

(*c*) A superficial examination takes place by a medical man appointed for the purpose by the society.

The last-mentioned plan is adopted by *very* few societies. In fact, a good collector who admits no new member without seeing him can often exercise a much more efficient control in this matter than a doctor.

And besides, the expense of a medical examination forms far too heavy a charge upon the comparatively slender amount of the premium income.

IX.—*Improper conduct,* or cases falling under that head.

(*a*) *Arbitrary acts of the Directors.*

These take place chiefly in the case of societies which are founded on the mutual principle. It is true that of these there are very many on the one hand which are governed according to democratic principles, but on the other hand, there are several in which despotism is supreme. Those societies which can be defined as private undertakings of the directors, belong generally to the latter category. In very many, and some of the larger burial clubs complaints of the misuse of the directors' discretion appear to be well-founded, especially in the matter of lapses. (In this connection *cf.* above, under VI, *a.*)

(*b*) *Arbitrary conduct of the Collectors.*

Inasmuch as the collector possesses considerable powers relative to the assured (*cf.* above under VII), he has also opportunities of misusing his authority, and it occurs not seldom that from time to time arbitrary and unwarranted lapses take place to the detriment of the assured. The transfer of members from one fund to another for the purpose of obtaining the introduction fee can, too often, be laid to the charge of the untrustworthy collector, and goes, along with frequent lapses, to the injury of the former fund. Usually the members of burial clubs never know what fund they belong to, but regard themselves insured by their collector. For he often speaks loosely of *his* members; in advertisements he issues invitations "to buy"; in short, he regards all insurances as his special property, and in this way ignores the administration of his society.

The reader must be warned not to suppose that the conduct here described represents the usual methods of the collectors. Many of them go to work in a truly philanthropic spirit, and it not infrequentlv happens that a collector will himself make up the deficient contributions, in order to help a poor and industrious family out of the mire.

(*c*) *Illiberality in payment of Claims.*

Although complaints are made of this, from certain quarters, the investigation has brought such cases, only extremely seldom, to light. It does not appear, either, that cases of such illiberality often occur. Especially is this true of the smaller clubs, the operations of which are confined to a single parish; and among workmen's clubs, such cases are wholly unknown.

(*d*) *The admission of members through the instrumentality of third parties who hope, thereby, to make a profit.*

The abuse above referred to is regarded by the committee as greatly exaggerated. It is true that it often occurs that there are simultaneous claims on two or more societies; but in so far as these are merely the result of endeavours to increase the sum paid at death, no exception can be taken to them. On the contrary, they resemble what takes place in the case of ordinary life offices. It is only the insurance of children's lives with several offices at a time which the committee thinks not without suspicion. (*cf.* below, under *g.*)

(*e*) *Excessive Rates of Premium.*

This reproach is not well-founded. It is true that members pay a proportionately high premium, but in most cases not too high a one. The rates of these burial clubs must, in fact, be relatively high:

1. Because the remuneration of the collectors is, and must be, high in comparison with the small contributions.
2. Because all expenditure and claim payments are a severe tax upon the financial resources of the smaller types of societies.
3. Because many members lapse their insurances very early, and before the initial outlay connected with their introduction has been recouped.

(*f*) *The Burial Clubs do not rest upon a scientific basis.*

Unfortunately, the charges which are brought against burial clubs on this score are only too well-founded. The principal cause of this regrettable state of things is *ignorance*—that is to say, want of acquaintance with the requirements of actuarial science. If these sins are often committed, it is with no wrong intention. In general, the directors and managers have no idea that the help of science is indispensable. There are even cases of societies which, after having attained a fine growth, come to the ground as a consequence of their prosperous condition inducing them to prematurely increase the benefits paid away by them, which benefits are much too considerable and are quite out of keeping with any scientific rules. On the other hand, there are examples of societies which make far too considerable reserves, and, nevertheless, go on working with high premiums; the number of the members of these societies remains stationary, or even decreases, and the societies fail to attain a proper expansion.

One of the first tasks of future legislators will be to compel burial clubs to place themselves under scientific administration.

(*g*) *Burial Clubs have an unfavourable influence upon infant mortality.*

Two considerations give occasion for this charge.

1. There appear to be cases in which children are insured two, three, or more times, in as many offices (*cf.* above, under *d*.)
2. Several—especially the larger—societies have introduced a system of "*free benefits*", that is to say, where the parents are insured, they are entitled to receive a small sum (usually less than Fl. 10) at the death of a child, *without its being necessary to pay any premium therefor.*

A committee appointed by the "Netherlands Society for Promoting Medical Science", pronounced as follows on this subject: "The system of 'free benefits' exercises on the parents a demoralizing "influence, and, in very many parishes of our land, very sad evidence "of this is shown by an enhanced death-rate among children, "especially among those who have not yet passed their first year "of age."

The following table gives a view of the mortality of the societies in general, and of those *with* and *without* the "free benefit" plan in particular:—

	Number of Members	Yearly Mortality	Rate per-cent	Insured Risks	Claims	Claims per-cent
174 Societies *without* "free benefits"	811,285	13,215	1·63	*fl.*55,190,986	*fl.*743,851	1·35
22 Societies *with* "free benefits"	1,004,200	28,513	2·84	*fl.*53,414,000	*fl.*934,373	1·75
Together	1,815,485	41,728	2·30	*fl.*108,604,986	*fl.*1,678,224	1·545

The greater mortality in the second group finds its explanation in the consideration that, in the case of the societies *with* "free benefits", a proportionately large number of *very young* children are insured, whereby a correspondingly high mortality prevails.

The question now arises whether this mortality is really enhanced by the system of "free benefits."

The committee declare, as to this, it cannot be shown that the charges in question are without any ground. They think that, in fact, insurances on the lives of children give occasion for sad abuses, although they recognized as exaggerated the claim that these insurances offer a price for "disguised child murder."

The state of things in regard to this matter, appears to the committee to be so serious, that one cannot be satisfied without legislative interference which shall strike at the root of the evil.

X. In conclusion, we give some figures whereby the extent of the operations of the burial clubs is exhibited.

Half the total population (or 2,250,000, more or less, out of 4,500,000) are insured in some burial club or other, and that for an average sum of 60 gulden per head, or for a total sum of about 130 million gulden.

The total insurances yield a sum of more than 4,100,000 gulden as premiums.

The burial clubs pay out yearly, in respect of about 50,000 deaths, a total sum of more than 2,000,000 gulden.

The total amount of the yearly expenses comes to more than 1,400,000 gulden.

The total assets of the societies reaches about 12½ million gulden; the total income to more than 4,500,000 gulden.

With these figures, a brief description closes the contents of an exceedingly rich report—one that must ever remain a principal fountain of knowledge respecting the condition of things in Holland as regards the institutions in question.

* * * * *

A second principal source of information we find in the report of the "State Commission appointed to enquire into the Condition of Workmen", which, at its meeting of 6 May 1890, deputed its first sub-committee "to make an investigation with respect to the insurance "and other provident measures for workmen against accidents, sickness, "death, or advancing age, in so far as these measures are not "connected with definite industrial establishments."

In two respects the task of this first sub-committee of the State Commission differed from that of the committee appointed by the "Society for Promoting Objects of Public Utility."

1. The task of the former extended, not merely to burial clubs, but to sickness societies, insurance against invalidity, and so forth; in a word, to all provident associations and insurance societies.

2. The object of the investigation was the obtaining of more exact knowledge respecting, not *the conditions and operations* of burial clubs, but the co-operative tendencies of the workmen with regard to the existing associations and insurance societies. There lay in the foreground, not the societies themselves, but their influence upon the families of the workmen.

In December 1892, the sub-committee in question* published a complete report, accompanied by several supplements and by verbatim minutes of all evidence taken. (There were 353 witnesses examined, of whom, in all, 17,159 questions were asked.) Here is a gigantic work, a compilation running to no less than 1,370 pages, and on each page evidences of well-directed knowledge, keen criticism, and philanthropic thoughts.

It is impossible to give an abstract of this work, even in the briefest form. There are 840 societies included in the investigation, namely:—

1. Sickness societies.
2. Burial clubs.
3. Sickness *and* burial clubs.
4. Life insurance societies which restrict their insurances below Fl. 300.
5. Pensions and widows' funds or associations.

On the whole, the operations of these societies were shown to be beneficial for the working classes. Such associations cultivate the sentiment of unity, and foster the friendship and brotherly relationship of the workers among themselves.

The two great principles on which most of these societies depend are the principles of *self-help* and that of *co-operation*. "To-day I for you, to-morrow you for me", might be their watch-word.

Moreover, philanthropy often plays its part; the funds or societies are glad to receive the donations which the workman does not like to ask *for himself*. Again, many societies are founded and officered by disinterested philanthropists, who sacrifice their money and time for the sake of the workman.

In this connection are those societies especially to be admired which have been established in several parts of the country by the "Society for Promoting Objects of Public Utility."

* The members of this sub-committee were Jhr. Dr. W. F. Rochussen (President), J. P. de Bordes, J. F. Jansen, and S. M. van Wijck.

Akin to these philanthropic efforts are the motives which induce many firms to work together for the establishment and maintenance of friendly societies for factory hands.

After the fashion of these, however, there are other societies not associated with definite industrial institutions (that is to say, *free*), and this has led to excessive authority being vested in their managers.

Again, the societies which are supported by Ecclesiastical Poor Law authorities ("Kerkelyk Armbestuur") are of the nature of benevolent institutions, as are also those which are supported, and wholly or in part managed, by the Poor Law authorities of any particular parish ("Gemeentelijk" or "Burgerlyk Armbestuur").

Finally, the *business* principle appears in the foreground in the case of many societies. Even the physician, who affords the opportunity to the working classes of securing his professional services for a small, but regular payment, must, in this respect, be regarded as a man of business. Gain and loss are a matter of private account with him, and he is at liberty to accept or reject a candidate as he pleases.

Very noteworthy, in this connection, is the following statement:—

"Large sickness benefit societies require, in respect of matters "technical and financial, a prudent and energetic management of "the first order. Life insurance presents a great variety of risks, "especially in the hands of well-meaning amateurs. There is no "doubt that the participant in its benefits, in many cases, both "as regards medical treatment, and as regards provision against "death, will derive *the best and most valuable services from those* "*persons who make a professional subsistence thereby.** From the "point of view of public welfare, no grounds of complaint can be "alleged, assuming that the acceptance of the risks is based upon a "foundation which affords adequate security, *and that the society does* "*not hide its professional character under the mask of mutual help.*"*

These words should be indelibly impressed upon the minds of those legislators of the Continent who have introduced a State supervision, which appears to be directed against the societies which work in the province of life assurance *as a business*, especially.

It need hardly be said that the report of the committee appointed by the "Association for Promoting Objects of Public Utility", was of prime use to the Commission of Enquiry in its labours. The extraordinary merits of this report are repeatedly brought forward, and the pains which have been bestowed upon its compilation often extolled. Nevertheless, upon an important question, the conclusions of the Commission of Enquiry differ from those of the earlier committee, namely, on the question of infant mortality (*c.f.* above IX, sub. *g*). In our judgment, especially after carefully reading the minutes of the evidence taken before the commission, it appears as clear as daylight that the darker charges, to which even the earlier committee of investigation attached so great an importance, rest entirely upon "hearsay", and that, possibly in good faith, they have passed from mouth to mouth. Almost unanimous was the verdict on this point of doctors, managers of burial clubs, and the assured themselves. Not only could no single example be adduced of

* The italics are ours.

negligent and bad treatment of children for the sake of the insurance money, but it even appeared that the treatment in general of the children of the lower classes was excellent, always so, as far as the certainly often very needy circumstances of the parents permitted. What good *can* be done for the child is done, and in case of need the parents literally take the bread from their own mouths for the children, and that whether insurance money is payable at the children's death or not. Instead of revealing dismal secrets, then, the commission had indeed brought to light the fact that the Dutch workman stands on too high a moral level to be willing to sacrifice his child for the sake of a few guilders. It affords one great satisfaction to be able to hold this opinion on good grounds and without risk of being accounted an optimist.

* * * *

About a year ago the draft of a law for regulating life insurance was published in Holland by State Commission* appointed for the purpose.

This draft law dealt at once with both life insurance offices and burial clubs (and analogous institutions), whence its unity is destroyed and a varied mixture of provisions present themselves, which apply sometimes to one institution, sometimes to the other, and sometimes to both.

The irregularities which are brought home to some of the burial clubs are represented by the commission as common to life offices in general, which is a great injustice to these. Contrary to the well-founded views of the Commission of Enquiry, the danger of an increase in infant mortality is much over-estimated, and those societies which treat life insurance as a branch of business are regarded as the natural enemies of the assured, and treated as such.

These erroneous apprehensions gave rise to a proposal for a harsh and arbitrary State inquisition, searching deep into the management of burial clubs and life insurance societies by the instrumentality of irresponsible officials, probably lacking the necessary qualifications for the task.

The general opposition which was aroused by this proposal—a proposal, moreover, which was made without paying any attention whatever to the views of the leaders of our companies—gives good ground for hope that it will never pass into law, and that we shall cherish in Holland the system which has approved itself in legislation in every aspect—the English system of compulsory publicity combined with freedom of competition.

* The President of this Commission was the former President of the Committee appointed by the Association for Promoting Objects of Public Utility, Prof. Molengraaff. The other members were: Dr. Bolle, Dr. Simons, Prof. van Geer and Schuylenburg.

Les Sociétés de Secours Mutuels en Espagne.

Par J. MALUQUER Y SALVADOR.

I. Notices Historiques.

L'organisation des Gremios (Corporations de métiers, Guilds etc.) et d'autres associations ouvrières en Espagne, pendant le Moyen-Age, a un véritable intérêt pour l'étude de la question actuelle.

Le Gremio, constitué sous le patronage d'un saint, avait un but religieux, un but industriel et un but ressemblant à ceux des sociétés de secours mutuels de nos jours. Les statuts de ces associations ordonnent qu'on secoure les associés dans leurs maladies; ainsi que s'ils deviennent invalides. Ils accordent, en outre, des indemnités aux veuves des membres de la corporation et des dots à leurs orphelines.

Plusieurs de ces corporations furent puissantes, parmi elles le Colegio del Arte mayor de la Seda (Collège de l'Art supérieur de la Soie) de Valence, qui fit un emprunt de 2,000 livres (5,000 *pesetas*) l'année 1647, pour soulager les malheureuses conséquences de la peste, laquelle somme était très-importante dans ces temps reculés, comme le prouve le fait qu'un siècle après, le budget des dépenses de l'association d'aveugles de la même ville était le vingtième de la dite somme et, cependant, cette association, fondée en 1329, fut bien organisée sur des préceptes charitables, qui dépassent le but des sociétés modernes d'assurances sur la perte de la vue.

Les statuts des dites corporations anciennes reconnaissent autant d'importance aux prévisions de la bienfaisance qu'une Ordonnance Royale de 1505 défendait à un certain Gremio de Barcelone de donner le titre de maître à quelques-uns des aspirants qui n'auraient pas payé toutes leurs souscriptions à la confrérie de secours mutuels de leur corporation.

De telles associations n'ont jamais disparu de l'Espagne et, sous a dénomination de Hermandades (Unions fraternelles) et de Monte-Pios, elles se sont étendues dans tout ce pays, aussi bien dans les grandes villes que dans les petits villages.

Il y a quelques années une enquête fut faite par une Commission des réformes sociales que le Vicepresident d'honneur de ce Congrès, Mr. Moret y Prendergast, eut l'heureuse initiative d'organiser, étant Ministre de l'Intérieur. Selon les données qui furent apportées à la dite commission, il existait en 1883, dans la province déjà mentionnée de Valence, 63 sociétés de secours mutuels, lesquelles se composaient de 15,202 membres.

Dans la Catalogne et la Biscaye, il y a un plus grand nombre de sociétés de la même espèce.

La ville de Madrid est le domicile social de puissantes corporations nationales de secours mutuels, parmi elles une des employés de chemins de fer et une autre d'un organisme militaire, qui ont des capitaux importants un million et quatre millions de pesetas, respectivement.

II. Régime Légal.

Les "sociétés de secours mutuels, de prévision, de patronage etc." sont soumises à la loi du 30 juin 1887, sur le droit d'association et, en outre, aux préceptes dont j'ai fait mention dans le rapport "La législation des assurances en Espagne—I."

Les principales dispositions de la loi en vigueur sont comme il suit:

Les fondateurs doivent présenter au Gobernador Civil de la province (le Préfet du Département) les statuts de la société dans le délai de huit jours avant qu'elle n'entre en fonctions. Chaque société devra enregistrer les noms, les professions et les domiciles de tous les associés. La société est obligée d'avoir un livre de récettes et de dépenses. Elle doit adresser tous les ans son bilan général à l'autorité de la province. Les sociétés qui perçoivent ou qui distribuent des fonds pour le secours de leurs membres, sont contraintes de faire un compte semestriel des récettes et des dépenses de l'association. Il faut quelles en donnent connaissance à leurs associés et à l'autorité. L'inobservance de ces derniers préceptes est punie par des amendes de 50 à 150 pesetas, imposées aux Directeurs. Les autorités judiciaires sont les seules qui aient la faculté d'ordonner la dissolution des dites sociétés.

Le service médical et pharmaceutique de toutes les sociétés de secours mutuels d'Espagne sera desormais soumis à la haute inspection des corporations officielles de médecins et de pharmaciens, organisées dans le mois d'avril actuel.

Un important Congrès national est en voie de préparation, pour discuter sur de thèmes relatifs aux sociétés coopératives, et parmi eux, celui qui suit: projet d'une loi spéciale sur les associations coopératives de toutes sortes.

III. Principes Généraux des Sociétés Espagnoles de Secours Mutuels.

Pour le préparation de ce rapport, j'ai demandé leurs statuts à un grand nombre d'associations de cette espèce et je les ai revisés consciencieusement, mais, cependant, le présent abrégé ne peut avoir d'autre intérêt que celui d'un essai de généralisation de préceptes très divers. Dans ce compte rendu, j'ai principalement en vue les sociétés ouvrières de secours mutuels.

Risques assurés.—Les sociétés espagnoles de secours mutuels assurent les risques suivants : maladies, accidents du travail, manque d'occupation, non-validité, mort etc. La plus grande partie des associations de ce genre admettent les risques de maladies et d'accidents, et le risque de maladies, surtout, a été le mieux étudié par les sociétés de secours mutuels de ce pays-ci.

Les hommes, de même que les femmes, peuvent s'assurer contre ce risque, dans les sociétés de secours mutuels; mais les maladies spéciales de la femme sont exceptées (les conséquences de l'accouchement, la chlorose, les affections hystériques etc.). Les sociétés de secours mutuels, cependant, composées de femmes sont beaucoup moins nombreuses que celles des hommes, et, quand aux associations qui admettent ensemble des individus des deux sexes, il y en a moins encore.

Les associés ont droit aux indemnités quand ils sont atteints de maladies acquises accidentellement et depuis le rentrée dans la société. Les infirmités chroniques n'y sont pas comprises, et, pour cela, dans la phtisie, on réconnait le droit aux secours seulement jusqu'au moment où elle est devenue chronique, et, dans la folie, jusqu'au jour où l'aliéné soit conduit à un asile. Les personnes attaquées de maladies épidémiques survenues dans la ville où la société aurait son domicile, de même que dans celle où demeure l'associé, ne seront pas secourus non plus.

L'origine de la maladie ne doit pas être volontaire. On accordera, par conséquent, aucun secours aux malades qui seront victimes de l'alcoholisme et de blessures occasionnées par le port d'armes, quand il n'est pas justifié. Si ces blessures ont été faites à l'associé dans des disputes qu'il aurait cherchées, ou même si ces accidents sont produits par son intervention dans une émeute politique, ou dans une action criminelle quelconque, il n'aura aucune droit non plus à être indemnisé.

Conditions exigées pour être associé.—Qui appartiennent à l'ordre phisique : Bonne santé, qu'on doit faire constater, soit par l'assujettissement de l'aspirant à une periode d'observation, souvent de trois mois, soit par une expertise médicale. Ce dernier moyen est exceptionnel dans les Monte-Pios. Absence d'infirmités chroniques. Validité du corps. Age : depuis 10 ans jusqu'à 50, et, généralement, de 18 à 40 ans. Domicile dans la ville du siège social, ou, tout au moins, dans la contrée environnante.

Conditions de l'ordre morale.—Honnêteté. Exercice d'une profession ou d'un métier. N'avoir pas été condamné par les tribunaux et n'avoir pas été l'objet d'un ordre d'expulsion émis par une société analogue quelconque.

La faculté d'approuver ou de repousser une pétition d'entrée est absolue et discrétionnaire de la part de la société.

Restriction du nombre des associés.—Quelques sociétés n'ont pas de semblables limites, mais, cependant, plusieurs Monte-Pios n'admettent plus qu'un nombre restreint de membres. Le maximum est depuis 150 jusqu'à 1,000 individus, selon les associations. On peut affirmer que le maximum est proportionnellement plus elevé dans les sociétés modernes que dans celles d'ancienne date.

Devoirs des Associés.—Le principal devoir est le payement d'une souscription périodique, qui peut être hebdomadaire, mais qui est généralement mensuelle. Les souscriptions sont d'habitude égales pour

tous les membres. S'il y a, cependant, des hommes et des femmes dans la société, les souscriptions sont différentes pour chaque sexe ; elles sont inférieures pour le sexe féminin.

Si l'homme paye mensuellement 1·25 pesetas, la femme donne une peseta. Il y a une société très ancienne où les hommes contribuent avec 0·56 pesetas, les femmes avec 0·41, et deux époux ensemble avec 0·64 pesetas.

Un petit nombre de Monte-Pios admettent diverses sortes d'associés et mettent en rapport les droits respectifs des membres et leurs souscriptions.

La souscription mensuelle est très distincte dans chaque société, depuis 0·20 pesetas (dans une humble association de laboureurs de la province de Valence) jusqu'à cinq pesetas (dans quelques sociétés de commis-voyageurs) ; mais la souscription la plus généralement payée est d'une peseta, outre les droits d'admission et les petits frais pour le service de la perception.

Il y a dans la province de Biscaye d'importantes sociétés de secours mutuels qui perçoivent un taut pour cent. sur les salaires et sur les appointements de leurs associés. Par exemple, dans une association qui se compose de tous les employés et de tous les ouvriers des fabriques de la Compagnie "Altos Hornos,"[1] le dit taut pour cent. est de 3% sur les journées des ouvriers et de 2% sur les appointements des employés ; et dans l'association des employés et des ouvriers de la Compagnie "La Vizcaya," le taut pour cent. est de 2% sur les appointements et sur les journées.

Séjour de l'associé dans la contrée où il demeure.—Des indemnités sont accordées aux sociétaires qui sont atteints de maladies en voyageant hors de leur contrée, mais dans la Péninsule, si le dit voyage ne dépasse pas un certain délai, par exemple, trois mois. A l'expiration de ce terme, l'associé est déchu de ses droits ; il peut, cependant, à son retour, en demander la réhabilitation.

Appel du médecin pour soigner les associés malades.—Quelques sociétés de secours mutuels, parmi elles diverses associations de Bilbao, offrent aux associés malades les soins du médecin titulaire, en outre du service pharmaceutique.

Les sociétés qui ne se chargent pas des soins médicaux, imposent à l'associé, comme condition inéluctable pour la jouissance de ses droits, l'appel d'un médecin pourvu d'un titre officiel, et les statuts d'anciennes et modestes sociétés de secours mutuels de Barcelone défendent énergiquement à l'associé malade de demander les soins d'un médecin empirique.

Limite du taux des indemnités.—Dans les institutions de prévoyance mentionnées, le chiffre réglementaire de la souscription et celui des indemnités ne peut être dépassé, et, en outre, beaucoup de sociétés de secours mutuels ne permettent pas à leurs associés d'être membres d'aucune association analogue, ou tout au plus de deux.

Droits des associés.—1er modèle de statuts. Ceux-ci classent les sinistres en deux subdivisions : maladies qui se guérissent par les soins de la médecine et accidents qui se soignent par les procédés de la

[1] La société mentionnée, outre les secours aux associés malades, donne de l'instruction à leurs enfants

chirurgie. Les accidents peuvent être simples ou graves (par exemple, la fracture d'un os).

Les personnes atteintes d'une maladie ou d'un accident grave sont secourues dans plusieurs Monte-Pios de Barcelone par des indemnités journalières de 3, 4 ou 5 pesetas, selon les sociétés, et les individus victimes d'un accident simple reçoivent 2, 2·50 ou 4 pesetas ; le terme moyen est de 3 et *de 2 pesetas* respectivement.

Il y a un délai maximum pour la durée du droit aux indemnités.

Par exemple, ce délai est de 90 jours pour les maladies, de 60 jours pour les accidents graves, et de 40 jours pour les accidents simples.

Dans le cas où le maximum est dépassé, les préceptes des sociétés sur cette question sont trop divers pour les résumer avec la concision du rapport actuel.

2ème modèle de statuts.—Ceux de l'association de Bilbao déjà mentionnée, peuvent servir par exemple de ces reglements.

Les associés ont droit aux soins des médecins titulaires de la société, aux medicaments ordonnés, et, en outre, aux indemnités journalières " quand ils seront empêchés de travailler pour cause de maladie, de blessures ou de contusions," d'accord avec le tarif qui suit :

Journée ou Appointements Par jour		Indemnité journalière.	
		Blessés	Malades
	Pesetas.	Pesetas.	Pesetas.
	0·75	0·50	0·37
1 à	1·50	0·75	0·62
5 à	6	2·25	2·00
6·25 et au-dessus	. . . .	2·50	2·25

Dans ces statuts, il y a le minimum de restrictions.

IV. Résumé.

1°. Les sociétés de secours mutuels sont connues et organisées en Espagne depuis une date très ancienne et elles donnent d'heureux résultats.

2°. Il y a des ressemblances entre quelques principes de leurs statuts et ceux des sociétés modernes d'assurances sur les accidents.

3°. L'étude de toutes les règles des sociétés de secours mutuels est intéressante, parce que, comme le reconnait la Conférence de Berlin de 1890 en approuvant une proposition des délégués belges, ces institutions de prévoyance et de secours mutuels doivent être de plus en plus développées " conformément aux traditions et aux mœurs de chaque pays."

4°. Les sociétés espagnoles de secours mutuels ont une longue expérience pour le calcul des primes et des indemnités ; mais elles n'appliquent pas tous les principes de la science actuarielle, ce qui est aussi un défaut de quelques nations très progressives, signalé dans notre important Congrès de Bruxelles de 1895.

5°. Il y a dans ce pays-ci une tendance initiée à présent au sujet de l'application aux sociétés de secours mutuels des progrès de l'assurance contre les accidents, tout en respectant, dans des limites raisonnables, les traditions espagnoles à l'égard des secours mutuels.

Annexe.

Données relatives à une Société éspagnol de secours mutuels.

"*El Taller*," *Société fondée en* 1851 *à Valence.*

Quinquennium 1893–97.

Nombres d'associés	Hommes	820
	Femmes	730
	Enfants	72
Cotes mensuelles	De 0·50 pesetas	9,300 ps.
	De 0·20 „	216 „
Indemnités journalières	Hommes	2,051 ps.
	Femmes	775 „
Dépenses	Honoraires des médecins	2,399 ps.
	Médicaments	2,060 „
Nombre de décédés		24
Secours à leur familles		600 ps.
Fonds en caisse le 31 Decembre 1897		15,378·45 ps.

Statisque de la morbidité en 1897.

Nombre de malades			Moyenne de la durée des maladies
Hommes	Femmes	Enfants	
447	452	43	12 jours

Translation.

Friendly Societies in Spain.
By J. Maluquer y Salvador.

I.—Historical Summary.

The organization of the Gremios (corporate trades, guilds, &c.) and of other workmen's associations in Spain, during the Middle Ages, has a real interest in the study of the question before us.

The Gremio, established under the patronage of a saint, had a religious object, an industrial object, and an object similar to those of friendly societies in our day. The rules of these societies provide help for the members in sickness, and also when they become incapacitated; and, besides, assistance for the widows of members, and for their orphan daughters.

Several of these corporations were powerful, and among them the "Colegio del Arte Mayor de la Seda" (College of the Higher Silk Industry) of Valencia, which contracted a loan of 2,000 livres (5,000 pesetas) in the year 1647 to lighten the sad effects of the plague, which sum was very large in those distant days, as is evidenced by the fact that in the next century the budget of expenditure of the association for the blind in the same town was the twentieth part of that sum, and nevertheless that association, founded in 1329, was well organized on charitable lines, and surpassed those of modern societies assuring against loss of sight.

The rules of these corporations recognized so fully the importance of benevolent foresight that a Royal Ordnance of 1505 forbade a Gremio of Barcelona to confer the title of "Master" on some of the applicants who had not paid up fully their subscriptions to the brotherhood of mutual help in their corporation.

Such associations have never died out of Spain, and, under the names of "Hermandades" (fraternal unions) and "Monte-Pios", they scattered themselves throughout the whole country, as well in the great towns as in the small villages.

A few years ago, an enquiry was made by a Commission on Social Reforms, which the Honorary Vice-President of the present Congress (Mr. Moret y Prendergast) had the happy idea of organizing, then being Minister of the Interior. According to returns furnished by that Commission, there existed in 1883, in the above-named Department of Valencia, 63 friendly societies, consisting of 15,202 members.

In Catalonia and Biscay there is a still greater number of societies of the same kind.

The city of Madrid is the headquarters of powerful corporations for mutual help, among which there is one for railway servants, and

another, a military organization, which have large funds of one million and four millions of pesetas respectively.

II.—Legal Situation.

"Friendly societies, provident societies, employers' societies", &c., are under the law of 30 June 1887, regulating the right of association, and besides are under the laws which I have enumerated in my report on "Assurance Legislation in Spain, I."

The principal provisions of the existing law are as follows:—

The promoters must file with the Prefect of the Department the rules of the society eight days at least before it commences operations. Each society must register the names, occupations, and addresses of all its members. The society must keep an account book of its receipts and expenditure. It must lodge each year a general balance sheet with the authorities of the Department. Societies which receive or spend money for the help of their members must prepare a half-yearly account of receipts and expenditure. They must report it to their members and to the authorities. Neglect to comply with these last requirements is punishable by fines of from 50 to 150 pesetas, levied on the managers. The legal authorities alone have the power to order the winding-up of the societies.

The medical and pharmaceutical branches of all friendly societies in Spain must in future be subject to the supervision of the official corporations of physicians and druggists established in April this year.

An important national congress is in course of organization to deliberate on matters relating to co-operative societies, and, amongst others, on a "proposed special law on co-operative societies of all kinds."

III.—General Principles of Spanish Friendly Societies.

For the purpose of preparing this report, I asked for the rules of a large number of societies of this description, and I have gone through them conscientiously; but, nevertheless, the present abstract can only possess interest as a general summary of very diverse regulations. In this statement I have kept principally in view workmen's friendly societies.

Contingencies Assured Against.—Spanish friendly societies assure the following risks: Sickness, trade accidents, loss of employment, incapacity, death, &c. The greater number of societies of this kind include the risks of sickness and accident, and sickness assurance especially has been studied by friendly societies in this country.

Men, as also women, can assure against this risk in friendly societies, but the special ailments of females (those arising from child-bearing, chlorosis, hysteria, &c.) are excluded. Friendly societies for women are, however, much less numerous than those for men, while those admitting both sexes are still fewer in number.

The members have the right to pay when they suffer from illness accidentally acquired after becoming members. Chronic sickness is

not included, and for the matter of that, in phthisis the right to pay is admitted only until the disease becomes chronic, and in insanity, until the lunatic is sent to an asylum. Persons attacked by an epidemic disease raging in the town where the society has its headquarters, or in the town where the member lives, have no right to compensation.

The illness must not be voluntarily acquired. No compensation, therefore, will be allowed in sickness to inebriates, or to those wounded as a consequence of carrying arms when that is not justifiable. If wounds have been incurred by the member in quarrels of his own seeking, or even if such accidents arise from his taking part in a political disturbance, or in any criminal proceeding whatever, he will have no right to any compensation.

Conditions of Admission to Membership.—Those relating to physical state: Good health, which must be proved, either by the applicant submitting to a period of probation, often three months, or by his undergoing medical examination. This latter plan is exceptional in the Monte-Pios. Absence of chronic infirmities; vigour of body; age, from 10 to 50, and, usually from 18 to 40. Residence, in the town where the headquarters are established, or at least in the immediate neighbourhood.

Conditions relating to moral state: Respectability; pursuit of a calling or trade. Never to have been convicted by a tribunal, and never to have been expelled by any analogous society.

The right to accept or decline an application for admission is absolute, and at the discretion of the society.

Limitation to the Number of Members.—Some societies have no limits in this direction, but, nevertheless, several Monte-Pios only admit a limited number of members. The maximum ranges from 150 to 1,000, according to the society. It may be stated that the maximum is generally higher in the modern societies than in the ancient.

Obligations of Members.—The principal obligation is to pay a periodical contribution, which may be weekly, but which is generally monthly. The contributions are, as a rule, uniform for all members. If, however, there are men and women in the same society, the contributions differ for the sexes, being lower for the women.

If the man pays monthly 1.25 pesetas, the woman pays 1 peseta. There is a very old society, where the men pay 0.56 pesetas, the women 0·41, and married couples jointly 0.64 pesetas.

A small number of Monte-Pios admit several classes of members, and fix the respective benefits according to the contributions.

The monthly contribution is very different in different societies, and varies from 0.20 pesetas (in a very humble society of labourers in the Province of Valencia) to 5 pesetas (in some societies of commercial travellers); but the most usual contribution is 1 peseta, besides admission fee, and small charges for working and collecting expenses.

There are, in the Province of Biscay, important friendly societies which levy a percentage on the wages and salaries of their members. For instance, in a society composed of all the clerks and all the workmen in the factories of the Company "Altos Hornos",* the percentage is 3 per-cent on the daily wages of the workmen, and 2 per-cent on the salaries of the clerks; and in the association of the clerks and

* This society, besides sick pay to members, educates their children.

workmen of the Company "La Vizcaza", the rate is 2 per-cent on the salaries and the wages.

Residence of the Member in the District of his Domicile.—Pay is allowed to members who contract illness while travelling beyond their own district, but within the Peninsula, if the journey does not extend beyond a certain time, for example, three months. At the end of that period, the member forfeits his rights; but, on his return, he may demand to be reinstated.

Medical aid for Sick Members.—Some friendly societies, among them several societies of Bilbao, provide their members with attendance by a salaried doctor, in addition to medicine.

The societies which do not supply medical aid, require of the member, as a necessary condition of enjoying his rights, the attendance of a doctor possessing an official diploma; and the rules of old and humble friendly societies of Barcelona emphatically forbid the sick member to seek the advice of an irregular practitioner.

Limitation of Benefits.—In the thrift societies referred to, the amount under the rules of the contributions and of the benefits must not be exceeded; and, in addition, many friendly societies do not allow their members to belong to any other analogous society, or at most, to two in all.

Benefits of Members.—First model rules. These divide the claims into two categories:—illnesses that are cured by the services of a physician, and accidents that require the aid of a surgeon. Accidents may be slight or severe (for instance, a fractured bone).

Those suffering from an illness or from a serious accident, are entitled, in several Monte-Pios in Barcelona, to daily pay at the rate of 3, 4, or 5 pesetas, according to the society, and those suffering from a slight accident, receive 2, 2.50, or 4 pesetas. The average amount is 3 or 2 pesetas respectively.

There is a limit to the duration of sick pay.

For instance, the limit is 90 days for illness, 60 days for serious accidents, and 40 days for slight accidents.

In the case of the limit being exceeded, the rules of the societies on the point are too varied to be dealt with in this brief report.

Second model rules. Those of the Society of Bilbao already mentioned, may serve as example of these rules.

The members have the right to attendance by the salaried doctors of the society, and to medicine ordered, and, besides, to daily pay "when they are prevented from working by illness, by wounds, or by injuries", in accordance with the following scale:—

Wages or Salary per Day.	Daily Allowance of Pay.	
	Injured.	Ill.
Pesetas.	Pesetas.	Pesetas.
0.75	0.50	0.37
1.00 to 1.50	0.75	0.62
5.00 to 6.00	2.25	2.00
6.25 and over	2.50	2.25

In these rules there is a minimum of restrictions.

IV.—Recapitulation.

1. Friendly societies have been known and worked in Spain from very ancient times, and have produced very good results.

2. There is a resemblance between some of the principles embodied in their rules and those of modern societies for assurance against accidents.

3. The study of all the rules of friendly societies is interesting, because, as was recognized by the Berlin Conference of 1890, in adopting a proposal of the Belgian delegates, provident institutions and friendly societies must be developed "according to the traditions and customs of each country."

4. Spanish friendly societies have had a long experience, available for calculating contributions and benefits; but they do not adopt all the principles of actuarial science, which is also a shortcoming among very progressive nations, as was shown at the important Brussels Congress of 1895.

5. A tendency is at present being initiated in the country to apply to friendly societies the progressive principles of assurance against accidents, while respecting, within reasonable limits, the Spanish traditions in the matter of mutual aid.

For Appendix, see next page.

APPENDIX.

Particulars regarding a Spanish Friendly Society.

The Society "El Taller", Established in 1851, at Valence.

Quinquennium, 1893-1897.

Number of Members	Men	820.
	Women	730.
	Children	72.
Monthly Contributions	Of 0.50 pesetas	9,300 pesetas.
	„ 0.20 „	215 „
Sick Pay	Men	2,015 pesetas.
	Women	775 „
Expenses	Doctors' fees	2,399 pesetas.
	Medicines	2,060 „
Number of deaths		24.
Assistance to their families		600 pesetas.
Funds in hand 31 December 1897		15,378.45 pesetas.

Particulars of Sickness in 1897.

Number of Members Ill.			Average Duration of Illness.
Men.	Women.	Children.	
477.	452.	43.	12 days.

On the Legal Organization of Friendly Societies in the United Kingdom, and some Actuarial Questions connected therewith. By E. W. Brabrook, C.B., F.S.A., *Chief Registrar of Friendly Societies.*

The definition of a Friendly Society contained in the Act of 1896, derived from a former Act passed in 1875, is as follows:—"A Society "for the purpose of providing, by voluntary subscriptions of its "members, with or without the aid of donations, for

(*a*) "The relief or maintenance of the members, their husbands, "wives, children, fathers, mothers, brothers or sisters, "nephews or nieces, or wards being orphans, during sickness "or other infirmity, whether bodily or mental; in old age "(which means any age over fifty) or in widowhood; or for "the relief or maintenance of the orphan children of members "during minority; or

(*b*) "Insuring money to be paid on the birth of a member's child, "or on the death of a member, or for the funeral expenses of "the husband, wife, or child of a member, or of the widow "of a deceased member, or, as respects persons of the Jewish "persuasion, the payment of a sum of money during the "period of confined mourning; or

(*c*) "The relief or maintenance of the members when on travel in "search of employment, or when in distressed circumstances, "or in case of shipwreck or loss or damage of or to boats or "nets; or

(*d*) "The endowment of members or nominees of members at any "age; or

(*e*) "The insurance against fire, to any amount not exceeding "£15, of the tools or implements of the trade or calling of "the members."

A society for any or all of these purposes may be registered on its adopting rules providing for the following matters:

1. The name of the society, which is not to be the same as that of an existing society, nor any name so nearly resembling that of an existing society as to be likely to mislead, nor any

name likely to deceive the members or the public as to the nature or identity of the society.

2. The place of office of the society, any change in which is to be notified to the Registrar, so that the public may always know where the society is to be found.
3. The whole of the objects for which the society is established, which must be one or more of those already mentioned.
4. The purposes for which its funds are to be applicable, which must relate to the promotion of such objects.
5. The terms of admission of members, such as the limitations of age, which may be any age exceeding one year, the entrance fee to be paid, &c.
6. The conditions under which any member may become entitled to any benefit assured, so that there may be no question as to the terms of the contract entered into by the society with its members.
7. The fines and forfeitures to be imposed on any member, which must be reasonable, and must bear relation to the objects of the society.
8. The consequence of nonpayment of any subscription or fine.
9. The mode of holding meetings, which must be meetings of the members, or of delegates appointed by members, or in the case of members under 16 years of age, of their parents or guardians.
10. The right of voting, which may be restricted to certain classes of the members.
11. The manner of making, altering and rescinding rules, which are not valid until registered, so that the registered rules and amendments shall always show the whole of the regulations binding upon the members of the society.
12. The appointment and removal of a committee of management, to which any name may be given, and which must be a distinct body from that which constitutes a meeting of members.
13. The appointment and removal of a treasurer and other officers, who may be required by the rules to give security.
14. The appointment and removal of trustees, in whom, by their mere appointment, the whole real and personal estate (except copyholds and government stock) of the society becomes legally vested, and whose names are to be sent to the Registrar, so that the public may always know who are for the time being the persons in whom such property is vested.
15. Where the society has branches, the composition and powers of the central body which is to control those branches, and the conditions under which any branch may secede from the society, of which condition the consent of the central body is not to be one.
16. The investment of the funds, which may be upon any security expressly directed by the rules other than the mere personal security of individual borrowers.
17. The keeping of the accounts.
18. The audit of the accounts once a year at least, either by two

auditors appointed as the rules direct, or by a public auditor approved by the Lords of the Treasury.

19. The making annual returns to the Registrar of the receipts, funds, effects, expenditure, and number of members of the society, in a form prescribed by the Chief Registrar.
20. The inspection of the books of the society by every person having an interest in its funds, so that any member may satisfy himself as to the manner in which the accounts are kept.
21. The manner in which disputes are to be settled. Every decision of a dispute in the manner directed in the rules is binding and conclusive on all parties without appeal, and cannot be reviewed by any court of law.
22. Where the society divides its funds, the previous satisfaction of all claims existing upon the society.
23. The keeping separate accounts
    (*a*) Of the receipts and payments under each separate table of contributions for benefits;
    (*b*) Of the expenses of management, which are not to be paid out of any contribution for benefits, but provided for separately by an additional contribution or otherwise.
24. A valuation once in every five years of the assets and liabilities of the society, including the estimated risks and contributions.
25. The voluntary dissolution of the society, by the consent of five-sixths of the members, a certain value being given to longer membership, and of all those who are in actual receipt of the society's benefits.
26. Application by a given number of the members to the Chief Registrar to investigate the affairs of the society, and if need be, to wind it up compulsorily.

There are several points to be noted in respect of this code of requirements. The first is, that nothing in the Friendly Societies Act compels a society to be registered; any body of men that does not care to fulfil them may become a joint stock company, or may remain unregistered, so far as that Act is concerned. The second is, that none of these requirements prescribe to a society the terms upon which its members shall contract with each other as to the rates of contribution and benefit; they may promise themselves large benefits for small contributions, and no objection can be raised to their registry upon that ground, except when the tables are annuity tables, and are not certified by an actuary. The third point follows as a necessary consequence, that the registering a society implies no approval on the part of the Registrar of anything that its rules contain, nor any opinion that it is a society on sound principles, nor any guarantee of solvency whatever. The fourth is, that the subsequent management of the society, when it has been registered, is entirely in the hands of the members, the Registrar having no right to interfere, unless the members themselves invoke his aid. The fifth is, that although a society may dispense with actuarial assistance in settling the rates of its contributions and benefits, except for annuities, it must employ a competent valuer once in every five years to ascertain its financial position; yet its members cannot be compelled to adopt the advice of

the valuer. From first to last, therefore, in obtaining registry, in settling the terms of their contracts, in managing their affairs, in responsibility for their own solvency, the essential character of British legislation in regard to friendly societies is voluntariness.

It may be asked, what advantages does a registered society possess over an unregistered one, to induce societies voluntarily to offer themselves for registry? These are set forth at length in the Guide Book published for the registry office, and need only be briefly stated here. Such societies do not become incorporated, but the trustees in whom their property is vested can hold land, and sue and be sued, and property passes from one trustee to another without the costs of conveyance, except in the case of stock in the public funds, which can be transferred, if necessary, by authority of the Chief Registrar, and in the case of copyholds, where the fees for admittance are limited by statute. Special remedies, in case of misapplication of funds, are provided, as well as a summary procedure against officers who fail to render their accounts, or to deliver up property in their possession. The society has a prior claim on the estates of deceased or bankrupt officers over all other creditors. Its documents are exempt from stamp duty, and its income from income tax. It can invest its money with the National Debt Commissioners at a fixed rate. Mortgages made in its favour are dischargeable by a mere receipt, without the cost and formality of reconveyance. It may have members from one year of age. Its members above 16 years of age can nominate the person to whom the sum assured is to be payable at death. Its trustees may pay sums up to £100 without requiring the claimant to take out letters of administration. Where the deceased was of illegitimate birth, they may pay as if he had been legitimate. Its members can obtain certificates of birth and death at a reduced rate. It may obtain the services of public auditors and public valuers at fixed rates. It may settle its disputes in its own way, without the cost of litigation, the jurisdiction of the superior courts of law being absolutely ousted. Finally, the registry of its rules and amendments, its removals of office, its appointments of trustees, its annual returns, and its quinquennial valuations, at a public office, where they can be inspected, and authentic copies obtained, is an advantage to the society and the public.

In calling attention to the actuarial questions that arise in connection with friendly societies, it must first be noted that where a society makes provision for old age, or other contingencies, by way of a certain annuity or certain superannuation, its rules cannot be registered until the tables of contribution for that assurance have been certified, either by the distinguished Actuary of the National Debt, Mr. Finlaison, or by some Actuary approved by the Treasury, and that a list has been drawn up by the Lords of the Treasury of Actuaries approved for that purpose, to which the names of qualified persons are added, from time to time, on their application. This is the only exception to the generality that every society may fix its own rates of contribution and benefit. It points to the serious importance attached by the Legislature to contracts for deferred annuities, where the fulfilment of the contract by the society is long delayed, and its failure to keep that contract would leave the member destitute in his old age. Comparatively few contracts for annuities

certain are entered into with friendly societies, many persons preferring to buy their annuities direct from the Government through the Post Office.

A great many of the other purposes enumerated as those for which a friendly society may be established are adopted by but few societies, and as many of these do not require accumulation of funds, no difficult actuarial question arises in connection with them. The two main purposes for which friendly societies in general are established, are the payment of a sum at death, and the provision of relief in sickness. With regard to the former, it presents no actuarial problem other than those which arise in connection with life assurance generally, and upon which it would be presumption in me to offer any remarks in the presence of professional gentlemen whose lives are spent in their investigation. Where the members of a society are all of one occupation, or live under the same more or less favourable hygienic conditions, the rates of mortality may, no doubt, be modified; but as the assurances are very small in amount, the question is not of great importance.

The one momentous actuarial problem in connection with friendly societies is that of the assurance of sick pay. Sickness, from the point of view of a friendly society, does not imply merely that a certain pathological condition has been set up: it means that the member is, for the time being, incapable through that condition of earning his own living. The same ailment may produce that result in one man and not in another. A man of idle and flabby character will lie up for a slight illness. A moral element is thus introduced, which it is exceedingly difficult to measure. A society afflicted with many such members, and managed so as to encourage them by lax supervision, will have a heavy experience of sickness. On the other hand, in many societies, a man who has got on in the world (as thrifty men are apt to do) will not claim sick pay to which he is entitled, desiring rather to support himself from his own resources than to burden a society consisting largely of poorer men. It has been felt, therefore, that the only way to obtain a correct estimate of the liability to friendly society sickness, is to obtain a large and comprehensive record of the experience of friendly societies in general, the defects and the excesses neutralizing each other. So long ago as 1824, the Highland Society made the first attempt of this kind; in 1835, the Society for the Diffusion of Useful Knowledge obtained returns, which were tabulated by Mr. Charles Ansell; in the same year, the first set of quinquennial returns of sickness and mortality required to be made to Mr. John Tidd Pratt, the barrister who then certified the rules of friendly societies, was due. These returns were entrusted to Mr. F. G. P. Neison, the elder, who used them, in 1845, for his work on Vital Statistics. In 1850, Mr. Henry Ratcliffe, the able corresponding secretary of the Manchester Unity of Odd Fellows, tabulated the results of the experience of that important body, and those of other societies, such as the Ancient Order of Foresters and the Independent Order of Rechabites, have been abstracted by Mr. F. G. P. Neison the younger. A later series of quinquennial returns was entrusted to Mr. A. G. Finlaison for tabulation. In 1882, the law requiring societies to send quinquennial returns was repealed, and in 1896 a volume was published, based on the results of the returns furnished

from 1856 to 1880, exhaustively investigated by Mr. William Sutton, Actuary to the Registry of Friendly Societies. These tables, as regards sickness, are based upon the experience of 4,480,809 years of life.

Quinquennial valuations of assets and liabilities were first required by an Act passed in 1846, but that Act was repealed before it had been in force five years, and the requirement was, therefore, a dead letter. It was not again made until 1875. Since that date, the operation of the enactment has been most beneficial. The societies have had the weaknesses of their financial position laid bare to them, and many societies have adopted heroic measures for strengthening it. These measures have been largely successful, and though very much still remains to be done, it may be safely asserted that the friendly societies of the United Kingdom occupy a stronger position to-day than they have ever held before.

How large a space they fill in the life of the industrial classes may be gathered from the figures of the latest complete return of registered societies published. In England and Wales, 22,313 friendly societies and branches had 3,861,519 members and £21,410,563 funds. In Scotland, 1,325 societies and branches had 283,512 members and £1,218,090 funds. In Ireland, 360 societies and branches had 58,570 members and £66,386 funds. The total for the United Kingdom was 23,998 societies and branches, having 4,203,601 members and £22,695,039 funds.

In addition, there were collecting burial societies, which are registered under "The Friendly Societies Act", but are subject to special regulations under "The Collecting Societies Act, 1896", and whose members include a large number of children. Of these, 35 in England and Wales had 3,318,942 members and £2,289,858 funds; and eight in Scotland had 556,273 members and £423,356 funds. The total for the United Kingdom (there being none in Ireland) was 43 societies with 3,875,215 members and £2,713,214 funds. The difference between the two classes of societies is marked by the fact that in the ordinary friendly society the funds are £5. 8*s*. per member; in the collecting burial society only 14*s*. per member.

The total for the United Kingdom of the two classes of societies together was 24,041 societies and branches, having 8,078,816 members and £25,408,253 funds.

There is great variety in the internal constitution of friendly societies. The 43 collecting burial societies, which have an average of 90,121 members each, and some of which have more than a million members, are governed by the ordinary machinery of general meetings, in some cases consisting of delegates elected at sectional meetings in the various localities where the members live, and are managed by committees appointed by the general meetings. The legislature prohibits the collectors, who go from house to house to receive the small contributions of the members, taking any part in the meetings; but the interests of the members are so small, and their number so large, that the members themselves can exercise little effectual control over the managers and collectors.

Of the other societies having an average of 175 members in each society or branch, the most important and progressive are the societies with branches, usually called the affiliated orders. The statute requires

that every such society shall have one or more funds under the control of each branch, and one or more funds under the control of the central body contributed to by each branch. The arrangement most generally adopted is for the individual branch, usually called "lodge" or "court", to keep under its own control the sick fund. The lodges or courts are grouped into principal branches, called districts, for the purpose of the burial fund, to which each branch in the district contributes. The central body has under its control a fund for assisting lodges or courts in distress.

Societies not having branches may be distinguished into several classes; such as the village club at the village inn, or the parish society at the schoolroom; the county society, organized and patronized by the county gentry; the deposit society, which is a combination of the friendly society and the savings bank; the large town society, which is virtually an insurance office; the Birmingham or Tontine society, which divides its funds every Christmas; the Jewish society, which adds to its other benefits that of providing relief during confined mourning; the women's society; the annuity society; the society in connection with a particular trade; and the miners' accident relief society.

In addition to these, a large field is occupied by unregistered societies, among which are included the great majority of the shop clubs. Some of these may possibly come into relation with the Registrar as "contracting-out schemes" under section 3 of "The Workmen's Compensation Act, 1897." No statistics are available of the extent of their operations, or the amount of their funds; but it is safe to say that they must constitute a material addition to the figures already given of the registered friendly societies. Taken as a whole, the subject of friendly societies is so vast, and presents so many points of difficulty, as to deserve the consideration of the scientific actuary.

On the Relations which should exist between the State and Non-Collecting Friendly Societies. By Philip L. Newman, B.A., F.I.A.

In the year 1793, the State first intervened in England to give a legal status and privileges to friendly societies. Since then, various enactments have from time to time been made, and the present relations of the State to friendly societies are embodied in the Friendly Societies Act of 1896. This Act, as far as non-collecting friendly societies are concerned, is practically a re-enactment of the Act of 1875, which was a development of the principles underlying previous legislation. The provisions of this Act are permissive—no society is compelled to register, but if it does, it is subjected to supervision on the one hand, and on the other, gains certain privileges. The supervision is exercised from a central office by means of annual returns to the Chief Registrar, a proper audit, quinquennial valuations, and registration of rules which must be approved by the Chief Registrar. The Chief Registrar has also power to appoint inspectors of a society for cause shown, to suspend or cancel registry, and to dissolve a society. The actuarial department of the Registry has not only supervised the returns of the quinquennial valuations, but also, in 1896, published the results of investigations into the rates of sickness and mortality experienced by registered societies during the quinquenniums 1856-60, 1861-65, 1866-70, and 1876-1880.

The privileges comprise, amongst others, the power of obtaining special remedies against accounting officers, priority against the estates of deceased officers, summary remedies in cases of fraud, the right of paying small sums to nominees without administration, facilities for the transfer of stock, and for depositing monies at interest with the National Debt Commissioners, exemption from stamp duties, facilities for holding land and instituting legal proceedings, and provision for membership of minors, and for juvenile societies.

It is impossible to convey any adequate idea of the discussions both in Parliament, and outside of it, which have formed public opinion and modified the law relating to friendly societies from time to time. A full account of legislation, from the first Act passed in 1793, up to the year 1874, is contained in the appendix to the fourth report of the commissioners appointed to enquire into friendly and benefit building societies. This commission, appointed in 1870, after an exhaustive enquiry, finished their investigations in 1874, and upon most of their recommendations the Act of 1875 was based; but I am of opinion that some of the chief benefits resulting to the Friendly

Society Movement arose from the publicity given to the evils of management which were exposed so unsparingly, from the demonstration of the advantages offered by well-conducted and solvent societies, and from the spirit of enquiry and discussion aroused. These, combined with the provisions of the Act of 1875, have done much to place friendly societies in a more stable position. I need not remind my hearers that friendly societies were originally benevolent associations, many of which have developed into insurance societies worked upon scientific principles. This change the State has allowed the societies to effect by means of individual effort: it was held that their natural growth would of necessity be stunted by too paternal a care, and that government supervision would be foreign to the independence which is at the root of our system of local self government. It must be remembered that the growth of the friendly society movement necessitated legislation, which was not forced by a paternal government upon an unwilling people.

That these principles are correct, and that modification and not revolution is now all that is necessary, should, I think, be admitted by every friend of the movement. The aim of the central office has been to inculcate sound principles, and to apply a steady pressure in the direction of proper finance and sound administration—to educate, in fact, and not to dictate. The movement can best be purged of abuses by complete publicity, which, inducing self-reliance and mutual confidence, will ensure permanent progress. Thus, since 1875, improved tables of contributions have largely come into use, the investments of the funds are better, and the management and sick supervision are much improved. These results are chiefly due to the progress made by the affiliated orders; they have put steady pressure upon their branches to register, their annual conferences have done more than anything else to stimulate and educate, and the system of district federation is admirably adapted to our national habits; yet, partly owing to the fact that the State only concerns itself with registered societies, that registration is optional, and that unregistered societies are allowed to be formed, charging absurdly inadequate contributions, and consequently collapsing; partly also to the omissions in the Acts of 1875 and 1896, and partly to the inadequate recognition given by Government to the importance of the work carried on at the central registry office, the old abuses in many cases still continue, more especially in unregistered societies, as, for example:

1. Inadequate and ungraduated contributions.
2. No periodical valuations.
3. Division of funds among members, and consequent dissolution of the society.
4. Dissolution when old members are beginning to make heavy claims upon the society.
5. Competition by means of inadequate rates.
6. Drinking habits fostered: meeting room at an inn: publicans the founders of societies.
7. Extravagant management: no proper supervision of sick pay, or limitation of expenses.
8. Exclusion of members without cause.
9. No book-keeping. Ignorance of secretaries.

10. Failure of the Act
    (*a*) to prevent insolvency;
    (*b*) to insist upon proper returns.

The dividing societies and burial clubs are at present the chief obstacles in the way of reform; they break up regularly as soon as the older members preponderate in number, and younger members withdraw because of the increased levies which have to be made, thus leaving to the older members the refuge of the workhouse, while the funds are usually consumed in dinners and drink. Although some of these clubs have had a long and successful career, most are ephemeral (the burial club which survives a generation is an exception), and the best that can be said for them is that they educate, and that many of their members afterwards join one of the affiliated orders.

Those who are advocating legislative reform have certain aims in view, the chief of which are—

1. To see levies abolished, and to substitute graduated and adequate tables of contributions.
2. To establish all societies on a solvent basis, and to extend and institute the system of periodical valuations.
3. To improve the management by the introduction of rational rules and correct book-keeping, and to promote safe investments.
4. To diffuse information as to the financial and actuarial principles upon which the societies should be based.
5. To promote the union or federation of small and isolated societies.

The pressing evil is "insolvency", and it may safely be affirmed that, in 99 cases out of 100, the cause of the failure of a society is "inadequate contributions." Now, although the great Orders of the country may safely be trusted to gradually raise the standard of solvency, still there is no compulsion to remain in an Order, and some branches have seceded rather than face increased contributions or diminished benefits. In course of time these societies must die out, but only at the cost of much unnecessary suffering; meanwhile other irresponsible societies will have sprung up to take their place. A new society, whose low rates compete against the higher and adequate rates of the Foresters or Manchester Unity of Oddfellows, will probably attract a large following, and although ultimate disaster is probable, if not certain, the financial position of the society is perhaps never understood until the rapid diminution of the funds, after 30 or 40 years, at last makes it clear to the management that the society is doomed.

It is this unsound finance, so disastrous in its results to working men, that I make bold to say must be taken in hand by the nation in order to protect the poorer members of the community from the lamentable results of their ignorance. Some have asserted that it is best to leave them alone; that to have State interference is to undermine their independence; that they can only work out their own salvation by eating the bitter fruits of experience; that the standard of solvency is being raised in the Ancient Order of Foresters, in the

Manchester Unity of Oddfellows, and in the other affiliated Orders, and that to bring in either,

(1) Standard tables of rates, or
(2) A standard valuation test,

would introduce a complicated and unwieldy system of control, which would destroy the very object aimed at.

The opposite system is well exemplified in the German law dealing with invalidity and old age, under which the State manages the scheme, and no initiative is left to the workman, while our Act of 1875 was a compromise attempting a practical, though partial, solution of a vexed question.

My proposals may be divided into two portions—

(1) The essential reforms;
(2) The unessential but desirable reforms and alterations.

1.—The Essential Reforms.

The principle should be the same as that which has been found so successful under present legislation, namely, complete publicity, but no Government management.

Firstly—Every society should be compelled to register.

I do not forget that in 1874, the Commissioners made the following remarks (IV. Report—P. ccv.). "When we remember that "probably one-third of the existing societies are unregistered, and "bear in mind how long many of them have carried on their business, "and how much alarm and dissatisfaction would be caused by an attempt "to enforce the measure (compulsory registration) upon them, we feel "that it is one which cannot be made. All that we can look to is the "education of the public to such a point as may enable them to "discern for themselves the importance of obtaining proper information "respecting the condition of the societies in which they are asked to "invest their money, and may induce them to prefer those which give "that information in the clear form prescribed by the Government to "those which withhold it."

Since the above was written, we have, however, had experience of the loyal way in which the Act has been welcomed by the affiliated orders, and the manner in which the leaders of the Friendly Society Movement have recognized the advantages of publicity and control, without interference with the management. We have also had experience of the working of a similar Act, the Life Assurance Companies Act of 1870, which, in its regulation of life assurance business, may be compared to the Friendly Societies Act of 1875, but which requires every company doing business to render returns in a prescribed form to the Board of Trade. Here, compliance with the Act is not optional; it is compulsory on every company to give the scheduled information for the satisfaction of the public. An optional system should not, therefore, be applied to societies carrying on the same insurance and annuity business, though on a smaller scale, and also undertaking sickness insurance, a risk differing in no fundamental principle from that of life assurance.

I venture to think that, if it were thoroughly understood that, beyond requiring information to be published as to the real position of a society, the Government would not interfere with its management, there would be neither alarm nor dissatisfaction, but that the public would welcome a measure which would enable them for the first time to discover which societies were worthy of their confidence.

This system, freedom of management with publicity, has been found to answer so well in England, when applied to life insurance business, that no one here in authority desires to alter it; on the contrary, the almost universal opinion appears to be that we only require to extend the system by giving a few more details regarding new business, investments, expenses, and bonuses on endowment insurances or other special classes, to satisfy us that the business will remain healthy for another generation.

Secondly—Every table of contributions and benefits should be hung up in a conspicuous place in the room appointed for meeting, and also the results of the last two valuations, scheduled in the following manner:—

Average Sickness and Mortality Experience during the past Five Years (if ascertained) compared with the Table used in the Valuation	The Average Rate of Interest realized by the Invested Funds during the past Five Years	The Rate of Interest used in the Valuation	The Tables of Mortality and Sickness used in the Valuation	The Number of Members in the Society, the Amount of the Funds, and the Actual Surplus or Deficiency	The Surplus or Deficiency per Member	Summary of Valuer's Recommendations

Thirdly—Extracts from such table, and the above schedule, should be advertised once a year, at least, in two local newspapers.

The effect of these regulations, combined, would not ensure that a society would either be well managed, or remain solvent, but it would ensure that the members had more accurate information as to the true state of the society than they have at present. It may well be hoped that in time a fuller knowledge of friendly society finance will be attained, not, perhaps, by the public, but by the secretaries, the presidents, and the managing committees of such societies. It is also to be hoped that the district newspapers may discuss from time to time the financial position of their local societies, so that, gradually, those societies which are financially sound will receive the support they deserve.

The opposite system involves Government inspection, Government control, a State standard of valuation, and perhaps State aid.

It may be urged in favour of this latter system, that the ignorance of the community is so profound, that more than publicity is necessary to guide them; they require coercing by those who are more fully informed on such matters, on the lines which the best societies now follow, and which all would not unwillingly follow were they better informed. Looking, however, to the hardy manner in

which these societies have grown up, to the intelligent and promising efforts now being made by the affiliated orders to induce their courts to become solvent, and to the slow, but sure spread of knowledge on the subject since the Act of 1875, I am convinced that were registration and publicity made universal and compulsory, a great lift would be given to the progress of the Friendly Society Movement.

The lesson of the past progress is, that if the movement is left to develope, an independence and strength will be assured, far more stable than that secured by any number of well-meaning props. Government aid is a false foundation for the vast edifice which the Friendly Society Movement has reared in our land. Further, the fact that it is almost impossible to fix upon a valuation standard which shall guarantee the solvency of the weak societies, with heavy sickness and poor investments, and yet shall be a proper test of a society with light sickness and well-invested funds, makes the proposal of a fixed Government standard hopeless. Finally, there are the dividing societies —are they to come under the iron rod of a "$2\frac{1}{2}$ per-cent Government (1896) table valuation?"

2. The Unessential Reforms.

It will be noted that the reforms already indicated and designated essential, are based upon absolute independence, but I am of opinion that we can effect a compromise between the conflicting principles of independence on the one hand, and effective State control on the other, without eliminating the important factor of self-help on the part of the members.

Any measures in the direction of compromise may be desirable, but should not be regarded as essential. I submit, however, that the time has now arrived for putting into force the recommendations of four out of the eight commissioners of 1874. Their views were not adopted in the Acts of 1875 or 1896, but neither were all the recommendations of the whole of the commissioners; chiefly, I expect, because public opinion was not sufficiently informed on the subject, and, as regards special certificates, because of the want of authority attaching to the tables then in existence. I cannot but quote their own words—

"It has always been the motive of friendly society legislation to "secure solvency. Hitherto the means have been inadequate, but we "believe that, if the authorities suggested by the report be con- "stituted", (a strong central staff, comprising competent actuarial power) "they will have knowledge and power sufficient to secure this "cardinal desideratum. At all events we are of opinion that an "opportunity of utilizing a great power will be unwisely omitted, if "such a tribunal with such materials shall merely register applying "societies, without discrimination, (only excluding societies 'formed "for illegal purposes'), and if its stamp of registration, and its "certificate for incorporation shall leave without earmark or dis- "tinction all societies which may have registration or incorporation, "although some may be utterly insolvent whilst others may have "every claim to public recognition and support."

"We propose, therefore, that it should be the duty of the

" Registrar to examine an applying society's rates of contribution and " benefit, and to advise, if need be, upon them, with a view to procure " the adoption of such rates as will, apart from mismanagement or " fraud, secure solvency. As it is not proposed that the Registrar " should have power to *compel* the adoption of such rates, and his " advice may fail to procure it, we suggest that it should be his duty " to grant discriminating certificates of registration, (Class A), at least " until the next periodical valuation." (Other societies were to be simply registered.) " We are not unmindful that there may be border " cases, and difficulty in drawing the line between those societies " which may or may not be entitled to the better class certificate. " But it is the very end of all the additional care which is recom- " mended that the line should be drawn and the distinction established " by someone, and if it be difficult for the Registrar with all his " means of knowledge and discrimination to do it, we apprehend that " the task will be, as heretofore, impossible for the poor and ignorant, " and that we shall continue to have the large majority of our societies, " although there may be vast numbers constantly joining them, " insolvent and unequal to their engagements. Whereas there might " be in the simple, tangible fact of a discriminating certificate, " something which the poorest and most ignorant would appreciate, " something which might point them to the good and guide them from " the bad, and in respect of which, in the present state of our actuarial " knowledge, the line might safely be drawn by those who will be the " centre of information on the subject."

This report proceeds to refer to the responsibility so undertaken by the State, and to assert that the State will undertake a far greater responsibility, if it shrink from the simplest mode of informing the public what, in its opinion, are good and trustworthy societies, and that even the educated public are far too ignorant of these matters to justify the publication, without criticism, of tables, accounts, and reports, and concludes—

" We are of opinion that it would presently come to pass that all " societies would be divided in an appreciable manner into two classes " only—societies presumably sound, Class A; and societies as to the " soundness of which nothing could be predicted because nothing had " been ascertained. As a better understanding of the whole subject " advanced, these societies would respectively gain and lose favour " with the public accordingly."

Supplementary to the above, every society requiring to be registered as a certificated society should have its tables of contributions and benefits certified as sufficient by an actuary or other competent person, such actuary to be one of a number authorised by Government, and no quinquennial valuation should be accepted unless made by a competent person, who should be compelled to hold an authorization from Government: this is no innovation, as all societies must now have their annuity tables certified by approved actuaries.

As regards the granting of distinctive certificates to existing societies, which might also be extended to all new societies whose tables were certified to be ample, there is no analogy between life assurance companies and friendly societies; the former, if insolvent,

cannot vary the terms of contract by arbitrarily increasing the premiums payable under their policies, nor can they diminish the sums assured, so that a valuation would usually disclose either a surplus or a deficit, unalterable until the next valuation. In a friendly society, on the contrary, it is possible to alter the tables of contributions and benefits, so that, immediately a deficit is discovered, it can be wiped out without delay: also, the period of five years during which it is proposed such certificate should continue, gives, apart from fraud or gross mismanagement, insufficient time for a solvent society to become hopelessly insolvent; any deficiency might be cancelled by a very moderate adjustment of the contributions or benefits.

Further, there is a national scheme of great importance, which, were it adopted, would immediately make it possible for insolvent societies to place themselves in a solvent position, which would not affect the prosperous societies, and which would mitigate the great evils which attach to the popular, but delusive, dividing societies. The proposal, not a new one, is, that the nation should grant a universal old age pension of 5*s*. a week out of Imperial taxation to every person over 65 years of age. The report of the Departmental Committee now considering the subject of old age pensions is not, at the time of writing this paper, published; but I notice they have rejected this scheme as not coming within the range of their reference. This is unfortunate, for, although public opinion is not prepared for this scheme, I am confident that no other has the smallest chance of success. The scheme was introduced, and has been ably advocated by so sound a thinker as Mr. Charles Booth, in his book upon "Pauperism and the Endowment of Old Age"; its bearing upon the pressing difficulties of the Friendly Society Movement is obvious. The crux at the root of all friendly society finance is the sickness in old age question. To banish this spectre from the valuation balance-sheet would be an incalculable relief to the movement. The advocates of this scheme maintain that a universal pension would, apart from the raising of our aged poor out of hopeless pauperism, bring many advantages in its train, such as the opportunity afforded of dealing with the able-bodied loafer or tramp, and the encouragement to thrift from the endeavours that would be made to supplement the pension. It is shown that the results would be, not a new charge upon the resources of the nation, but a mere transference of the incidence of the cost of the maintenance of the aged. The ultimate cost—some 16 to 20 millions a year—will fall upon the shoulders of the workers; that is, upon those, who, when their turn comes, will be supported by the succeeding generation. The amount required might be so levied that the incidence of the taxation would fall upon all classes. Indirect taxes, such as those upon tea and beer, and direct taxes, such as those on land, ground values, and death duties, might both be drawn upon, while the sinking fund of the National Debt, and Imperial grants in aid, which are now allocated to local authorities, might well afford substantial assistance to the financing of the scheme. The burden should not be appreciably felt by a rich community, whose annual income has been estimated at 1,420 millions, and whose lay-by approaches 200 millions a year. Our politicians, however, will not move until they receive a mandate from the nation. I am of those

who hold that it would be as sound an enactment as any within the last half-century of progress.

I have, of necessity, confined my proposals to those which I consider would stimulate the future progress of the friendly societies in this country in particular, and I am quite aware that they would be inapplicable to Germany, where an elaborate system of State management is in full operation; to France, where the movement has not taken hold upon the people, owing to their thrift in other directions; or to the United States, where, until recently, through the facilities for settling West, a competency could be attained more easily than in the thickly populated countries of the Old World.

Finally, a rigid adherence to the principle of the non-intervention of the State might be admirably adapted to the needs of a community well informed on actuarial matters, but, looking to the present ignorance of the nation, I am prepared to maintain that a compromise is best suited to our needs. We have to strengthen those societies which are striving after reform, by removing the ignorance which upholds existing abuses, and if, in so doing, we incidentally enlarge the scope of State action, it does not follow that voluntary association will decline; on the contrary, if care be taken to preserve the self-government we hold so dear, a well-considered central control will prevent abuses arising, and complete publicity will ensure the ultimate extinction of unsound societies.

Friendly Societies in Cape Colony.

By James McGowan, F.I.A., *Colonial Government Actuary.*

I.—Friendly Society Legislation in the Colony.

1. The Legislature appears to have dealt with friendly societies for the first time in the year 1880, when the House of Assembly appointed a Select Committee "to consider the question as to the expediency or "otherwise of giving further and more permanent security and "stability to the various friendly and benevolent societies in the "Colony."

2. A number of witnesses residing in Cape Town were examined by the Committee, but it was thought that the views of persons residing in other parts of the Colony should be ascertained, and the Committee recommended that a circular letter, asking for an expression of opinion on various points, should be forwarded to the Civil Commissioners in the several districts, in order that they might submit such circular to those persons connected with friendly societies who might be thought qualified to give replies.

3. Accordingly a circular was issued, and the replies were considered by the Committee which was re-appointed in the year 1881. It was finally recommended by the Committee that "Parliament should pass "a measure providing an effective, but economical system for the "registration of friendly and benefit societies, additional audit of "their accounts, complete periodical returns of their assets, liabilities "and general condition, also for the uninterrupted tenure and "protection of their property; and that those advantages should be "available to all properly-constituted societies that elect to take the "benefit thereof."

4. As a result of the recommendation of the Committee, an Act for the encouragement and protection of friendly societies was passed in the year 1882. This Act is known as Act No. 7, of 1882.

5. The following points may be noted in connection with this Act:

Section II. required every society seeking registration to forward a copy of its rules to the Attorney-General. On his being satisfied that such rules were in conformity with the Act, he issued a certificate, and the society was then deemed to be fully formed and established.

Neither by this section, nor by any other section, was it requisite for a society to give the slightest proof that its rates of contribution were sufficient for the benefits which it granted.

6. In the year 1889, a Select Committee was appointed by the House of Assembly to report upon the working of the Act No. 7 of 1882.

7. A desire for a Parliamentary enquiry seems to have arisen amongst some of the societies, owing to an unfavourable report from the Actuary to the Oddfellows in England, respecting the Bud of Hope Lodge, the leading friendly society in the Colony.

8. In 1883, the balance sheet of the Bud of Hope Lodge showed that the Lodge held funds amounting to about £6,000, and it was proposed by some members to divide a portion of this amount. The question was submitted to the Actuary in England, who found that, instead of there being any funds available for division amongst the members, there was an actuarial deficiency of about £2,100. A further report was obtained from the Actuary in 1886, in which he showed that the deficiency had increased to £2,800. As the Bud of Hope was looked upon as the most flourishing of the Cape societies, it became evident that if it was in an unsatisfactory state, most of the other societies would be in a like condition.

9. The enquiries of the Select Committee were principally directed:

1st.—To the contributions of the members as compared with the benefits conferred.

2nd.—To the nature of the investments.

3rd.—To the manner in which the affairs of the societies are managed and audited.

10. With regard to the point as to "the contributions of members as compared with the benefits conferred"; the Committee reported that the evidence taken convinced them that the "benefits conferred by "the societies, with scarcely any exceptions, are in excess of what is "justified by the payments", and it was recommended that a commission or skilled Actuary be appointed by the Government further to enquire into the condition and working of friendly societies throughout the Colony.

The Committee took evidence as to whether the registration of friendly societies should be compulsory, but they considered that question to be surrounded with difficulties, and they hesitated to make any recommendation until the further enquiry which they suggested had taken place.

11. The recommendations of the Select Committee were agreed to by the House, and the Government sent a circular letter to every friendly society in the Colony, asking for statistical information. Many of the societies refused to give the information asked for. Some had to be paid to supply the returns. About 30 societies in all complied with the circular letter, and an actuarial report was prepared, and in 1891 was submitted to Parliament.

12. In the year 1892, an amending Friendly Societies Act was passed, and one of the chief requirements of this Act is that "no society shall be allowed to register unless it be shown to the

" satisfaction of the Registrar that the contributions which it proposes " to charge are adequate to provide for the benefits which it undertakes " to grant." In the case of old-established societies, where it appears that the rates of contribution have been too low, it is provided that any new scale of contribution is to apply to members admitted subsequently to the date of registration. The contributions of existing members thus remain unaltered.

13. A further short amending Act has been passed, allowing members of registered societies to nominate persons to receive the funeral benefits without taking out Probate or Administration.

II.—Present Position of the Societies as regards Registration.

14. A fairly large number of societies have applied for registration under the Act 1892, but the requirement as to the adoption of adequate rates of contribution has proved a barrier to many of them. Only 14 societies have as yet seen fit to adopt new tables. Both the Acts of 1882 and 1892 are permissive merely, and not the slightest compulsion can be applied.

15. About 30 societies remain registered under the Act of 1882, so that in all, there are between 40 and 50 societies registered under both Acts. It is certain that a large number of societies will not seek registration of their own accord, many of them being very jealous of outside interference.

16. Very special difficulties are to be met with in any regulation of Cape friendly societies. For instance, a large number of members in Cape Town are coloured people, with little education, and it is hopeless to expect such persons to understand any proper system of book-keeping or accounts. Moreover, the birth and death rates amongst the coloured classes are very different from those experienced amongst the white population, and it is certain that the sickness rates are very different too.

17. At the time of the last census (1891), it was shown that there were in the Colony—130 friendly societies with 14,277 members; 3,302 members received sick pay amounting to £8,438 during the year 1890; 250 members died during the year; and the death claims in the year amounted to £4,671. The total income of the societies from all sources in the year 1890 amounted to £33,214, the total expenditure to £26,457, and at the end of the year the total accumulated funds amounted to £88,846.

Notes on the Friendly Societies of New Zealand.

By Geo. Leslie, *Assistant Actuary, Government Life Insurance Department.*

Out in the South Pacific Ocean, more than a thousand miles to the East and South East of the Great Island Continent of Australia, lies the Colony of New Zealand. It consists of three main Islands, known as the North, the Middle or South, and Stewart Islands.

The North Island extends over more than 7° of latitude, and has a coast line of about 2,200 miles in length, while the area is about 44,500 square miles.

Cook Strait separates the North and Middle Islands. At its narrowest part it is some sixteen miles across, but in the widest it is about ninety. The Middle Island extends over about 6° of latitude, the extreme length being about 525 statute miles. The coast line extends to about 2,000 miles, and the area is 58,500 square miles. Foveaux Strait separates the Middle from Stewart Island. This Island has a coast line of 130 miles, and an area of 425,390 acres.

The size of the colony may be better realized by the comparison of its area with that of Great Britain and Ireland. The area of the United Kingdom is given as 121,305 square miles, while that of the three Islands mentioned is about 103,660. Again the area of the Middle Island is a little larger than the combined areas of England and Wales.

At the dawn of the present century there does not appear to have been a single European resident in New Zealand, although an intercourse, chiefly by South Sea whalers, which gradually became more frequent, had been begun some years before, between the natives of these Islands and the English settlement in New South Wales. In fact, the work of colonization was not set about on anything like systematic principles till early in the year 1840, when settlements were formed at Wellington, on the south coast of the North Island, and also at Auckland in the north, at a distance of about 350 miles from the Wellington settlement on Cook Strait. In January of this year British sovereignty was proclaimed over the Islands of New Zealand.

In the following year, a settlement was formed on the west coast of the North Island, at Zaranaki, and called New Plymouth. This settlement is about 140 miles distant from Auckland, and 170 miles from Wellington.

Early in the year 1842, a settlement was established at the head of Blind Bay, on the north coast of the Middle Island, and called Nelson. The distance from Wellington is about 100 miles, and from New Plymouth 150 miles.

Owing to conflicts with the natives and other causes, no additional settlements were formed till March 1848, when the Otago settlement was formed by persons working in concert with the Lay Association of the Free Church of Scotland. This settlement lies about 350 miles South of Wellington on the east coast of the Middle Island.

Two years later, a settlement, promoted by members of the Church of England, was formed at Port Cooper in Banks Peninsula and the adjoining country, and was called the Canterbury Settlement, situated also in the Middle Island, about midway between Wellington and Otago.

From what has been said it will be seen that these early settlements were widely separated from each other, having neither the extensive steam services by sea nor the thousands of miles of railways which the colony now possesses. Hence, in many respects, they had, from the slow means of inter-communication in those days, to be self-contained, almost independent or complete in themselves. This characteristic was reflected in one of the earliest enactments of the Colonial Legislature, a comprehensive measure of a municipal character empowering the colonists to manage their own local affairs, and to provide for the good order, health, and convenience of the public. Again, by an Act of the Imperial Legislature, passed in the year 1852, granting representative institutions, the colony was divided into six provinces corresponding to the settlements already mentioned, each to be presided over by an elective Deputy-Governor, or Superintendent, and to have an elective Provincial Council empowered to legislate, except on certain specified subjects which were reserved for the General Assembly of the colony. This scheme it was expected would promote the progress of the colony generally by the honourable rivalry which might be expected to spring up amongst the various settlements when entrusted with their local control.

Each settlement was thus in great measure a microcosm of the larger world whence the immigrants had come, and would not have been complete without those voluntary associations for mutual aid, self-help, and social progress, known as friendly societies, which, even in those days, had in Great Britain been found to be productive of so much benefit, not only to the members and those dependent upon them, but also to the community at large.

The first friendly society which can now be traced was the New Plymouth Friendly Society, established in the first year of the settlement, 1841. It was a true example of the isolated local friendly society common in England, but a type which has not had many imitators in New Zealand. It continued its operations down to the year 1880, when it was dissolved with a view to re-construction on a new and broader basis. At the date of dissolution the number of members was 125, and the funds amounted to £3,057.

Within the next two years, friendly societies were established at Wellington, Nelson, and Auckland. In the case of the Nelson society, its formation was resolved upon during the passage out, of one of the emigrant ships, and the first meeting is said to have been held among

the tall fern near the beach a few days after the arrival of the ship. In each case these societies were of the affiliated type, and all owed allegiance to the Manchester Unity of Oddfellows in England.

Before the end of 1851, thirteen additional societies had been established, namely, two in the Auckland settlement, four in the Wellington, five in the Nelson, one in the Otago, and one in the Canterbury. Of these, eight were lodges, three were district societies, and two were Widow and Orphans Funds, and all were regarded as connected with the Manchester Unity of Oddfellows in England. This brings the total up to 17 societies. In November of this year (1851) the first census of the colony was taken, when it was found that the population (excluding natives) was 26,707 (namely, 15,035 males, 11,672 females).

While the founders of these societies in the colony deserve to be highly commended for their prudence and forethought for themselves, and as benefactors of their kind, it is matter for regret, though not of wonder, that like the large majority of members of friendly societies in Great Britain at that time, their knowledge of the scientific principles, on which such societies ought to have been conducted, was very limited. Accordingly the societies established in this colony in these early years were, from the commencement, worked under a false system. In all, the contribution appears to have been the same for all members, whatever their age at entry, and medical attendance and management expenses were paid out of the same fund as the sickness and funeral benefits.

Though these societies claimed to be lodges or branches of the Manchester Unity in England, the connection was of the most nominal character, and while the leaders in the parent society were seeing the necessity of taking decided steps to bring about financial reforms in the Order in England, little or no attempt was made by the directors to enforce these reforms upon the lodges in the colonies. Thus it came about that practically the lodges in each settlement were a law unto themselves, and fixed the rates of contributions and benefits upon benevolent impulse, rather than scientific principles. Their errors are, in the circumstances, matter for no reproach. The spirit is to be admired which led the founders to seek for means of independent support in sickness and old age, without the degradation of depending upon charity.

Particulars of the early operations of these societies would be very interesting, but, though believed to be in existence, are not available for the present purpose. The reluctance to publish particulars of their transactions was a feeling pretty generally diffused amongst members of friendly societies in those days, and even extended to some societies of far greater pretensions.

In 1852, the first society in connection with the Ancient Order of Foresters was established in Christchurch, in the Canterbury settlement.

During all these years, there does not appear to have been any statute dealing with friendly societies, but in the year 1856, owing to additions to their numbers and their increasing importance, an Act was passed for the regulation and management of friendly societies in New Zealand.

This Act appears to have been modelled on one passed in the

colony of New South Wales in 1853, which again bears a likeness to the Imperial statute of 1850. The preamble is as follows:

> "Whereas the protection and encouragement of friendly "societies for raising by voluntary subscriptions of the members "thereof, separate funds for the purpose of affording relief and "maintenance to the members thereof in sickness, old age, and "for other purposes of a provident and benevolent nature, is "likely to be attended with very beneficial effects by promoting "the happiness of individuals, and, at the same time, diminish "public burdens; and, as it is expedient to give protection to "such societies, and the funds thereby established, and to afford "encouragement to form like societies within the colony of New "Zealand.
>
> "Be it therefore enacted, &c."

This Act contains thirty-four sections, and has four schedules attached. It is provided that separate accounts shall be kept of each fund; that a society or branch shall not be legally established till rules are certified by the Attorney-General of the colony, or a barrister-at-law appointed by the Governor. When the rules are certified, an officer of the society has to file a copy with the Registrar of the Supreme Court for the province in which the place of business is situated, and thereupon such society or branch shall be denominated a "Certified Friendly Society." For every such certificate of rules of a friendly society a fee of two guineas has to be paid, and for certifying the rules of any branch of a society a fee of one guinea. It is also provided that the officer in charge of the accounts shall prepare a general statement once in each year before the 1 February, in the form provided in one of the schedules, and shall file the same with the Registrar of the Supreme Court aforesaid. In default of such return the trustees are declared incapable of prosecuting any action in any court of law.

In the construction of terms, it is provided that the word "society" shall include every branch thereof by whatsoever name it may be designated.

But it is not necessary to dwell longer on this Act, as it does not appear to have been taken advantage of, to any great extent, by the friendly societies of the colony; and the annual returns, if obtained (which is very doubtful), cannot now be traced. This Act remained in force for a period of 11 years, and, no doubt, helped in some measure to prepare the way for the more perfect Act which followed. During this period, the population of the colony increased rapidly (from 45,540 in 1856 to 218,668 in 1867), and, with the development of the resources of the colony which this increase indicates, a corresponding development took place in relation to friendly societies. Those whose establishment has been mentioned increased their membership and funds, while, as new centres of population were formed, new societies or branches of existing societies were formed, and began their beneficent labours.

In the year 1863, a lodge of the American Order of Oddfellows was opened in Dunedin, and a tent of the Independent Order of Rechabites was established in Auckland. In 1865, a sanctuary of the Ancient Order of Shepherds was established in Wellington. With the

establishment of the different Orders, something in the nature of a rivalry or competition took place to obtain new members, and this competition had an untoward effect on the efforts of financial reformers at that time. Yet, even in these years, some slight reforms were carried into effect in several districts of the Manchester Unity of Oddfellows. The equal contribution at all ages was seen to be inequitable, and was sought to be remedied by a graduated scale of initiation fees, and an extra annual contribution for members over a certain age at admission.

In 1867, a Bill was introduced into the Legislative Council to consolidate and amend the law relating to friendly societies. In introducing the measure, the Minister in charge of it explained that the Act of 1856 had been found defective in several particulars, and did not embody the provisions of the Imperial statute of 1855, or bring the statute law of the colony up to the point obtained by the law of England on the subject. Two other English Acts had since been passed to amend the law, and the object of the present Bill was to embody in one Act the whole of the law on the subject, including all the latest amendments made at home, so far as applicable to the circumstances of the colony.

This Bill was passed on the 10th October 1867, and came into operation on the 1st November following. In this Act, the interpretation of the word "society" remained the same as in the previous Act. Societies established under the former Act were to continue, and their rules were to remain in force till altered or rescinded. All copies of rules filed with the Registrar or Deputy-Registrar of the Supreme Court were to be taken off and transmitted before 1st January 1868 to the registrar under this Act, to be kept by him in such manner as should be directed by the Governor. The Governor was empowered to appoint a registrar, and an office to be the place of registration, and, until such appointments, the Colonial Secretary was to be the registrar, and his office the place of registration. No fees were to be charged by the registrar for any act required to be done by him under the Act.

One of the purposes for which societies might be formed was—"For the frugal investment of the savings of the members for the "better enabling them to purchase food, firing, clothes, or other "necessaries, or the tools, implements, or materials of their trade or "calling, or to provide for the education of their children or kindred" —but does not appear to have been taken much advantage of.

The Governor was also empowered to appoint in and for each of the provinces in New Zealand, or in and for any district or districts to be defined by him, a barrister, or solicitor of the Supreme Court, to be called "the revising barrister", to peruse the rules, &c., of societies; and, if any rules should be found to be repugnant to or inconsistent with the Act, or any of the laws in force in New Zealand, the revising barrister was to notify the society, with a view to having the rules objected to amended. When such rules were found to be in order, the revising barrister was to certify the same thereon, and return one copy to the society, and lodge another copy with the registrar, whose duty it was to register the same, and to notify in the *Gazette* that this had been done. He was also required to keep the copy of rules so transmitted to him amongst the records of his office.

This procedure to effect registration was entirely different from that which obtained under the Act of 1856, and there is no doubt it was a great improvement. For every certificate of rules of a society, a fee of two guineas had to be paid to the revising barrister, and for every certificate of rules of a branch of a society the fee was one guinea.

The next section was one of the greatest importance to the well-being of the friendly societies of the colony, had it been found possible to enforce its provisions. It provided as follows:

> "It shall not be lawful for the said registrar to register the "rules of any society assuring to any member thereof a certain "annuity or certain superannuation, deferred or immediate, or any "sum or sums payable as endowment, or in case of sickness or "death, or other object provided for by this Act, which is "susceptible of calculation by way of average, unless the tables "of contributions payable for such kind of assurance shall have "been certified by some actuary of some life assurance company "established in New Zealand, nominated by the registrar, or by "some other person nominated by the registrar, and such "certificate be transmitted to the registrar, together with a copy "of the rules aforesaid."

It would appear that this section, when sought to be enforced in the first instance, presented so many practical difficulties, that, for a number of years, it was not insisted on.

By the terms of this Act, no society could be registered which assured more than £200 in one sum, or more than £30 by way of annuity, or more than 21*s*. per week in sickness. Again, no member of more than one society could assure for more than £200, or more than £50 by way of annuity, or more than 42*s*. per week in sickness.

The provision of the Act of 1856, regarding annual returns, was re-enacted with this important addition. "Every society shall, within "three months after the 31st December 1867, and so again within "three months after the expiration of every five years succeeding, "transmit to the registrar a return of the sickness and mortality "experienced by such society within the preceding five years." An abstract of these returns was to be prepared by the registrar, and laid before both Houses of the General Assembly, and he was also required to lay before both Houses, every year, a report of his proceedings as registrar, and of the principal matters transacted by friendly societies during the past year.

If default were made in transmitting the general statement or copy of the last annual report of any society, or the quinquennial return, the officer making default was liable to a penalty of 40*s*. This Act, had it been wisely and judiciously administered, would have been of very great benefit to friendly societies, but, as has been stated, one of the most important provisions was held in abeyance, and the returns required by the Act, both annual and quinquennial, do not seem to have been enforced, and when furnished voluntarily by societies were neither published nor utilized for any useful purpose.

With such remissness in the enforcement of the provisions of the Act by the central authority, it is not to be wondered at that it became no terror to careless officers or a praise and glory to those who sought to comply with its provisions faithfully. Nevertheless, the advantage

of a legal protection to the funds was increasingly appreciated, and the registrations under this Act up to the time of its repeal in 1877, appear to have been 142, distributed as follows:

Registrations under the Act of 1856 and the Act of 1867 up to the end of		
Number of societies registered	1868	33
„ „	1869	15
„ „	1870	22
„ „	1871	10
„ „	1872	34
„ „	1873	26
„ „	1874–1877	2
	Total	142

The small number of registrations in the years 1874–77, was caused (1) by the Government seeking to bring into force the provisions which required the scales of contribution to be certified by an actuary, and (2) because a new Friendly Societies' Act had been introduced into Parliament in 1876.

In the year 1870, the Hibernian Australasian Catholic Benefit Society was established; in 1871, the Sons and Daughters of Temperance; in 1873, the Protestant Alliance; and in 1875, the United Ancient Order of Druids. The number of registered bodies in connection with the several Orders at the end of 1877, was as follows:

Society or Order	Registrations
Manchester Unity of Oddfellows	74
Independent Order of Oddfellows	2
Ancient Order of Foresters	39
„ „ Shepherds	1
Independent Order of Rechabites	3
Sons and Daughters of Temperance	4
Hibernian Catholic Society	8
Miscellaneous Societies	11
Total	142

For some years previous to 1877, many of the more thoughtful members, throughout the colony, had been watching with interest the events which were taking place in Great Britain in connection with friendly societies, and having come to the conclusion that the defects found to exist in the law and practice of the home societies existed to a considerable, if not quite the same, extent in the colonial ones, these members gave voice to their opinions by discussions in their societies, by articles in the press, and by other means, in order to effect what seemed to them the necessary reforms. One of the first results of this agitation was to give increased attention to the provisions of the existing statute, both by the Government and by members of societies. On the part of the Government, when rules were submitted for registration, the scales of contributions and benefits were submitted to the actuary connected with the Government Life Insurance Department for his opinion thereon, and on his finding the contributions, in most cases, such as he believed to be inadequate, registration was in consequence refused. Members, on their part, finding that the experience of societies had not been published in accordance with the provisions of the Act, reminded the Government of its duty and urged its performance. Many members believed the rates of sickness and

mortality to be much more favourable in New Zealand than in Great Britain, and as it was a fact that in the colony higher rates of interest were obtainable, it was strongly maintained that rates based on English experience were inapplicable, because unnecessarily high. Accordingly, during the Session of Parliament in 1877, a return was presented to both Houses of the General Assembly (relating to friendly societies under the Act of 1867) for the year 1876. It contained the following tabular statements:

(1) The number of registered and unregistered societies respectively known to exist in the colony, and giving a general view of the extent to which the information asked for by the Government had been supplied.
(2) The number of members and the sickness, mortality, &c., during the year 1876, in 140 societies in the colony.
(3) A statement of the benefit funds of these societies for the same year.
(4) A statement of the management funds.
(5) The assets and liabilities at the close of 1876,

and also some others, which do not call for mention.

From the first statement it was found that the number of registered societies to whom return forms were sent was 100, of unregistered societies 149, making a total of 249. As indicating the position of the leading orders at this date, it may be noted that 105 return forms were sent out to branches of the Manchester Unity of Oddfellows, 17 to the Independent Order, 60 to the Foresters, 22 to the Order of Rechabites, and 27 to the Hibernian Society. Complete returns were received from 86 registered and 54 unregistered societies. Incomplete returns were received from 7 registered and 39 unregistered societies.

The societies of which the number of members was known, were 188, and the number of members 13,969. From the other statements the following summary has been compiled:

Orders or Societies	Branches	Members	Number Sick	Sickness Days	Funds	
					Benefit	Management
Manchester Unity	75	5,836	631	31,161	55,339	5,582
Independent Order of Oddfellows	4	208	9	*	907	359
Ancient Order of Foresters	42	3,645	445	11,071	17,909	3,732
Ancient Order of Shepherds	1	25	3	185	58	12
Independent Order of Rechabites	4	258	48	2,271	970	63
Sons and Daughters of Temperance	3	173	24	805	987	3
Hibernian Catholic Soc.	6	274	31	1,028	801	112
Protestant Alliance	1	157	18	634	375	...
Miscellaneous Societies	4	427	44	980	3,396	15
Totals	140	11,003	1,253	48,135	80,742	9,878

* Information incomplete.

These statements, although incomplete, testify to the firm hold which the friendly society movement had already taken on the people of the colony (and, here it may be noted that, the estimated male population of the colony at the end of 1876 was 225,580), but the experience was far too limited on which to base tables of rates.

In 1875, a resolution was passed by the House of Representatives to the following effect:

"That it is desirable that the provisions of 'The Friendly "Societies' Act, 1867', which require action on the part of the "Colonial Government and which have hitherto remained, to a large "extent, inoperative, should receive the immediate attention of the "Government; that further provision is required to enable societies "more effectively to manage their own affairs, especially in respect of "registration, the regulation of tables of contributions, a periodical "valuation of liabilities, an efficient system of audit, and the securing "the proper responsibility of their officers; that in order to secure "such provision. . . . . a draft bill be prepared and circulated "among the friendly societies, inviting their suggestions and con-"currence prior to the next Session of Parliament, and that such Bill "should be then submitted to Parliament."

Accordingly, in 1876, a Bill was so submitted. It was, with a few alterations, copied from the Imperial statute of 1875. After being discussed at considerable length in both Houses, and undergoing several modifications at the instance of societies, it was withdrawn for the session. Next session it was introduced again, again discussed and amended, and finally passed.

In regard to the provisions of this Act, it seems unnecessary to enter at length, seeing that the Imperial statute on which it is founded is so generally known to all persons who have any acquaintance with the friendly society movement.

It will be sufficient to note the following points and provisions:—

In regard to registration the voluntary principle is maintained, and all fees are abolished. Societies granting annuities are required to have tables certified by an actuary, but the contributions for all other benefits are left to the discretion of societies. Payments on the death of children are limited to small sums; the assurance on adults is limited to £200, and annuities are limited to £50 per annum.

The duties devolving on the Registrar in England are in New Zealand divided between the Registrar and the Revising Barrister (provincial revising barristers being abolished), and the registrar may have attached to his office such assistants, skilled in the business of an actuary and an accountant, as shall from time to time be required.

The Governor is authorised to make regulations from time to time to carry out the provisions of the Act; copies of such regulations to be sent to every registered society and branch one month previous to being laid before Parliament.

Annual returns of receipts and expenditure, and quinquennial returns of the sickness and mortality experienced, are continued. The valuation of the assets and liabilities of all registered societies every five years is made compulsory, the valuers to be appointed by the societies, but to be approved by the Governor; or, valuations may be made through the registrar.

The Act, being the outcome of so much thought, enquiry, and discussion, was viewed with favour by the great bulk of societies. At the same time it was seen that much of the power of the Act for good or ill would depend on the regulations to be issued under it, and also upon the tone and spirit of the registrar in the practical enforcement of the more stringent provisions.

Soon after this Act was brought into operation it was seen that to increase its usefulness certain amendments were necessary. To effect these a Bill was introduced during the Session of 1878 and passed in October of the same year. It repealed that portion of the principal Act which required that amendments of rules should be published in the *Gazette*. It provided that information as to sickness, mortality, &c., should be rendered by societies annually instead of quinquennially. An absolute prohibition was enacted against the appropriation of moneys belonging to a sick and funeral fund to management or medical expenses. In view of the circumstances that the majority of the bodies with which the Acts have to deal are in reality only branches of larger Orders, the central offices of which are in England or Australia, permission is accorded to them to register rules implying subordination to governing bodies outside the colony, and to refer to the general laws of such bodies, provided such general laws are sent to the registrar; but this permission shall not have the effect of giving force to any general law that is contrary to any of the express provisions of the Colonial Acts.

These privileges have been greatly appreciated, and largely taken advantage of.

A Consolidating Act was passed in the year 1882, and amending Acts were also passed in 1886 and 1892; but these do not alter or reverse any of the fundamental principles which lie at the basis of the Act of 1877.

Here it may also be noted that in the year 1882 a resolution dealing with the question of National Insurance was submitted to the House of Representatives by the Colonial Treasurer (the late Sir Harry Atkinson). The motion made and question proposed was as follows (*Parliamentary Debates*, Vol. 42, p. 190):—

"That in the opinion of this House, provision should be made " against sickness and pauperism by compulsory national insurance, to " secure the following benefits: (1) Sick pay for every single person, " male or female, between the ages of 18 and 65 years of not less than " 15*s*. per week during sickness. (2) Sick pay for every married man " of not less than 22*s*. 6*d*. per week, and for every married woman " 7*s*. 6*d*. per week during sickness. (3) A superannuation allowance " of 10*s*. per week for every person, male or female, from 65 years of " age to death. (4) An allowance of 15*s*. per week for every widow " with one child, increasing according to scale with the size of the " family to 30*s*. per week until the children are 15 years of age."

The motion was introduced by an able and exhaustive speech from the Colonial Treasurer, and the subject was debated for some time, but finally the debate was adjourned indefinitely.

During the passage of the Consolidating Act of 1882 through Parliament, and later on in the same session, the question was raised that the State should pay for the cost of the quinquennial valuations,

and also compensate secretaries of friendly societies for compiling the returns required by "The Friendly Societies Act." In reply, the Colonial Treasurer said "He had found on communicating with some of the "best societies in New Zealand that they were not at all disposed to "accept any payment for this, being desirous of being entirely "independent of the Government. . . . . For himself he thought "that a reasonable amount for the clerical work imposed upon them "(the secretaries), and also payment for the quinquennial examinations, "would be fair and reasonable, and he would give the House an "opportunity of considering that question when the supplementary "estimates came down." This promise was carried out, and the appropriation asked for granted by the House. The vote has been continued every year since, and we believe has been taken advantage of by every society with the exception of the Otago district of the Manchester Unity of Oddfellows, which, however, is the second largest in the colony.

In 1895, an Act was passed entitled "The Unclassified Societies' Registration Act", to make provision for the protection of the funds and property of societies not registered under any other enactment by enabling them to become incorporated under this Act. The Act was introduced mainly in the interests of cricket, football, boating, and other clubs; but, inasmuch as it repeals the provisions of the Act of 1882 in respect of the registry of specially authorised societies, it has been thought advisable to mention it here.

The appropriation on the part of the State in respect of the Friendly Societies Registry Office for the year 1897–98 is £1,140, made up as follows: Salaries, £630; other charges, cost of annual returns, valuations, &c., £510; and from this it will be seen the department is administered very economically.

Having brought the sketch of legislative enactments concerning friendly societies up to date, it remains to be considered how the Acts have been administered, what advantage has been taken of them by the persons for whose benefit they were passed, and what improvements and progress have been made by societies since the Act of 1877 came into operation.

In December 1877, the office of registrar was conferred upon the Registrar-General of the Colony, the intention being that the two offices should be held conjointly. In March 1878, the office of actuary was conferred on Mr. F. W. Frankland, and that of revising-barrister on Mr. H. S. Fitzherbert, a solicitor and barrister of the Supreme Court, practising in Wellington. In August of the same year, two public valuers were appointed, both being active members of the Manchester Unity of Oddfellows in the Otago district.

In his first report the Registrar details the work performed by him (under considerable difficulties for lack of sufficient assistance) in carrying out the new duties of his office. No doubt great assistance was obtained from the forms, regulations, &c., issued under the Imperial Act, but even with these at hand, time was taken up in adapting them to the requirements of the colonial statute. It is sufficient evidence of the activity of the office to state that not only had the work indicated been performed before the middle of 1878, but a series of tables based on the experience of the Manchester Unity of Oddfellows in England for the years 1866–70, with an interest basis

of 4 per-cent—which in the first instance had been calculated by the two gentlemen afterwards appointed public valuers—had been checked by the actuary and made ready for publication.

In response to the first issue of annual returns to the 126 societies and branches on the register and believed to be in existence, 105 were accepted as satisfactory, and the statements contained therein may be summarized as follows:

Number of members at end of 1877	8,560
Number of deaths of members in 1877 ...	72
Number of deaths of members' wives in 1877	40
Number of members sick	1,084
Number of days' sickness	49,090
Average age of members	32·9
Amount of sick and funeral funds	£95,144
Amount of management funds	£9,293

In the second report, the registrar, in notifying the registrations, conversions into branches, and amendments of rules, which had taken place during the year, makes mention that the leading feature of the new rules registered is the adoption of a graduated scale of contributions *for new members* in place of the uniform rate formerly charged to entrants of all ages. While the societies are commended for their action in this particular, it is pointed out that only in the case of one society (the Independent Order of Oddfellows) is the new scale "such "as to reasonably insure confidence in the ultimate success of the "society." In other cases they are told that the future prospects "are unsatisfactory unless the funds be largely benefited by an "exceptional absence of sick claims, or by successful investments, or a "very high rate of secession." Two valuable memoranda were appended to this report, one for the information and guidance of friendly societies, the other introductory observations on the table of rates of contribution. In 1896, this paper was, at the request of a conference of delegates from the several districts of the Manchester Unity, reprinted by the registrar.

In his third report, the registrar intimates that the section of the amended Act of 1878, which prohibited the appropriation of moneys belonging to the sick and funeral fund to management or medical expenses, had been the cause of some trouble in two societies. In one (a district of the Manchester Unity of Oddfellows), all interest earned beyond 4 per-cent had for some years been credited to the management funds of lodges; in the other (a district of the Ancient Order of Foresters), it had been the custom to pay the cost of medical attendance and medicine (about 20*s.* per member per annum) out of the sick and funeral funds of courts. These practices, being illegal, had to be stopped. Much correspondence took place between the office and the societies, and a petition was presented to Parliament by one of them, but ultimately all opposition to the clause was withdrawn. In this and many other cases, the action of the office in seeking to instruct members, and the adoption of a kindly and sympathetic tone in the official correspondence, did much to allay irritation and smooth away difficulties, and it is satisfactory to find that though the person holding the office of registrar has been changed more than once, the

early practice of giving considerate, sympathetic, and liberal advice, is still a strong feature in the annual reports presented to Parliament. Every new scheme bearing on the Friendly Society Movement, which engages the attention of the public, is considered "with an open mind"—fallacies are exposed and sound principles are sought to be inculcated on every possible occasion. Each year a certain number of societies and branches make default in not sending in satisfactory annual returns, and some persons are of opinion that greater pressure ought to be put upon defaulters to make them perform a plain and simple duty.

The progress in registration, returns, membership, and funds of friendly societies proper, may be gathered from the following table containing the information for particular years:

Year	Registered Societies and Branches	Number making satisfactory Returns	Number of Members	Total Funds	Average Funds per Member
				£	£
1877	123	105	8,560	106,358	12·425
1880	177	158	13,165	173,331	13·166
1883	343	270	18,843	255,371	13·553
1886	388	320	21,679	334,676	15·438
1889	424	395	26,013	430,544	16·551
1892	443	409	28,754	501,155	17·429
1895	447	407	30,905	581,119	18·803

A census was taken in April 1896, when it was found that the male population of the Colony numbered 371,415, of whom 201,972 were over 20 years of age.

At the present time it is believed that the number of friendly societies, supported by voluntary contributions, which have not availed themselves of the facilities and privileges conferred by registration, are few. It may also be noted that particulars of isolated friendly societies, juvenile societies, and societies of females, are not available.

The benefits promised by friendly societies are in kind much the same in all societies, but especially in the affiliated type which predominates in New Zealand. (1) Sickness benefits, generally 20*s*. per week for the first six months of sickness, 15*s*. to 10*s*. during the second six months of sickness, and 10*s*. to 5*s*. for any sickness after a continuous sickness of twelve months. (2) Funeral benefits, generally £20 on the death of a member, and £10 on the death of a member's wife. Another benefit highly appreciated by the members is medical attendance and medicine to the member, his wife and family, the cost of which varies considerably with the locality.

As particulars of the transactions of societies cannot be given in detail, the following table of percentages and averages for the six undernoted years may supply as much information as is desirable:

Percentages and Averages deduced by the Registrar.

	1880	1883	1886	1889	1892	1895
Mortality Members per thousand	6·75	7·30	6·91	6·44	6·38	6·52
FUNERAL BENEFITS:						
Average per Member	3*s.* 3*d.*	3*s.* 4*d.*	3*s.* 9*d.*	3*s.* 5*d.*	3*s.* 1*d.*	3*s.* 8*d.*
Sick Members, percentage	13·35	15·18	15·46	15·81	19·96	17·93
SICKNESS (weeks)						
Average per Member	0·94	0·99	1·04	1·14	1·33	1·34
„ „ sick	7·07	6·51	6·69	7·29	6·65	7·49
AVERAGE CONTRIBUTION						
Sick and Funeral Fund	£1·35	£1·35	£1·33	£1·35	£1·41	£1·39
Average Sickness Benefit per Member	14*s.* 6*d.*	14*s.* 6*d.*	17*s.*	18*s.*	20*s.* 10*d.*	21*s.* 4*d.*
Average Sickness Benefit per Member sick	£5·76	£5·20	£5·50	£5·68	£5·22	£5·66
RATIO OF TOTAL SICKNESS (PER-CENT) TO						
(1) Sickness 1st six months	65·12	64·53	67·38	61·40	64·53	61·77
(2) „ 2nd „	10·10	6·33	8·36	9·20	7·82	7·88
(3) „ after 12 months	24·78	29·14	24·26	29·40	27·65	30·35
Average Contribution to Medical and Management Fund	£1·40	£1·43	£1·38	£1·32	£1·37	£1·38
Average Medical Expenses	18*s.*	18*s.* 11*d.*	18*s.* 7*d.*	18*s.* 3*d.*	19*s.* 2*d.*	19*s.*
„ Management Expenses	13*s.*	10*s.* 9*d.*	10*s.* 5*d.*	10*s.* 4*d.*	10*s.* 2*d.*	9*s.* 10*d.*

For the purpose of indicating the Orders or Societies which find most favour with the people of this colony, as well as exhibiting some particulars of the experience and resources of each, the following table has been compiled from the returns for the year 1895:

Name of Order or Society	Central Bodies	Lodges, &c.	Number of Members	Number of Deaths	Sickness Weeks	Total Funds	Average	
							Sickness per Member Weeks	Funds per Member
						£		£
Manchester Unity of Oddfellows	15	130	11,889	98	18,932	299,709	1·59	25·21
Independent Order of Oddfellows	1	23	1,305	6	1,162	23,650	0·89	18·12
National Independent do.	1	2	301	3	304	3,321	1·01	11·03
British United do.	1	1	77	...	123	729	1·60	9·47
Ancient Order of Foresters	8	101	9,447	56	11,763	159,307	1·25	16·89
Ancient Order of Shepherds	..	1	57	...	166	869	2·91	15·25
United Ancient Order of Druids	2	47	3,911	16	3,622	34,588	0·93	8·84
Independent Order of Rechabites	2	33	1,458	6	1,636	29,347	1·12	20·13
Sons and Daughters of Temperance	1	11	830	1	845	6,832	1·02	8·23
Hibernian Catholic Society	1	12	748	5	1,066	10,884	1·43	14·55
Protestant Alliance Society	1	11	680	5	813	8,577	1·20	12·61
Railway Benefit Societies	...	2	202	3	540	3,306	2·67	16·37
Totals	33	374	30,905	199	40,972	581,119	1·33	18·80

Valuations.

The Act of 1877 provided that a valuation of the assets and liabilities of every registered society should be made once at least in the five years next after the 1 January 1878, and so again within six months after the expiration of every five years succeeding the date of the first valuation, by a valuer appointed by the society and approved of by the Governor. The tables of expected sickness and mortality recommended to valuers were those known as the Manchester Unity Experience 1866–70 combined districts, with interest at the rate of 4 per-cent.

The first valuations under the Act were made in 1879 as at the end of 1878, and every succeeding year the number of valuations increased till all the societies on the register at the coming into operation of the Act had been valued.

An inspection of the valuation reports discloses the following features: Secessions have never been taken into account, and no modifications have been made in the results on account of favourable or unfavourable experience, the comparatively speaking small numbers at risk in the several lodges, &c., not affording sufficient warrant to the valuers to regard the deviations from the standard as permanent features.

In every instance much labour has been spent in comparing the actual and expected sickness and mortality, and societies have been fully informed of the bearing of the experience on their future prospects. Whether the valuation disclosed a surplus or deficiency, efforts were made to discover the source or sources, and the reports contain much valuable advice as to the steps to be taken to bring the societies into a position of solvency. Generally the recommendations are in the direction of the close and profitable investment of the funds, where the management has been slack, or an increase in the contributions, or a reduction of the benefits in other cases. It is satisfactory to note that one result of the valuations has been a decided improvement in the management of the funds, but only a very few lodges have either increased their contributions or decreased their benefits in consequence of the deficiencies disclosed on valuation, and it is to be feared that in many cases nothing but a bitter experience will convince the members of some societies of the necessity of altering their methods. One point has, however, been gained; no society can now plead ignorance of its position, or whither it is tending, and it is to be hoped that with increase of knowledge members will be found in each society who will not rest satisfied till a position of solvency is reached. One district of the Manchester Unity has adopted a rule requiring lodges, whose assets are less than a certain proportion of the liabilities, to take steps to improve the position, and it would be matter for satisfaction if all societies followed in the same course. As all, or nearly all, the valuations made up to the present time have been carried out on the same data and interest basis, the results are more comparable than if, on the one hand, a variety of tables and rates of interest had been employed, or, on the other, modifications had been made in the results with the view of adapting them to the experience of particular societies or lodges.

The difficulty of exhibiting the true financial position of societies composed of branches grouped together is so well known to all familiar with the subject that it need not be enlarged on here. At the same time, it is thought that, subject to the necessary reservations and limitations, some indication of the direction in which societies are tending may be gathered from an exhibition of the numbers included in each valuation, and the relation of assets to liabilities in several selected societies.

Three districts of the Manchester Unity of Oddfellows are working under the same scale of contributions and benefits; two have been valued four times, and the remaining one, thrice. The contributions charged are not regarded as sufficient to secure the benefits promised, under normal conditions, but the variations in actual practice will be seen from the following exhibit. (Note: Throughout the following tables the heading "Ratio" will mean the proportion of assets to liabilities per £1).

	Hokitika District		Otago District		Invercargill District	
	Members	Ratio	Members	Ratio	Members	Ratio
		£		£		£
1st Valuation . . .	575	0·812	1620	0·846	470	·970
2nd „ . . .	379	·878	1628	·949	500	1·090
3rd „ . . .	332	·862	1801	1·044	577	1·096
4th „ . . .	239	·928	2174	1·049	...	...

In the case of the first district, it will be seen the membership is decreasing owing to the depopulation of the localities in which the lodges are situated. In consequence, few new members are joining, but the position is being improved, nevertheless, owing mainly to the withdrawal of members. The other two districts are seen to be progressive as regards members, and as the management is careful and prudent, solvency of the districts as a whole has been reached. At the last valuation of the Otago District the ratio of assets to liabilities ranged from 0·775 to 1·800, and the average of rates of interest credited to the benefit fund for the quinquennium varied in the several lodges from £2·30 per-cent (a young lodge) to £8·19. Four other districts of the Manchester Unity are found to exhibit the following results—

	Auckland		Hawke's Bay		Wellington		Ashley	
	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio
		£		£		£		£
1st Valuation . .	1,127	0·945	525	1·032	834	0·961	455	1·064
2nd „ . .	1,307	·994	805	1·090	1,037	·975	544	1·157
3rd „ . .	1,097	1·107	958	1·154	1,086	·982	672	1·035
4th „ . .	1,443	1·055	...	...	1,216	1·057	...	...

Auckland and Wellington are two of the oldest districts in the colony, and though both are solvent as societies, a good many of the

lodges exhibit considerable deficiencies. The other two districts are young, have been well managed, and are working under fairly adequate rates. Viewing the Manchester Unity, as a whole, at the present time about as many lodges exhibit surpluses as deficiencies, and this is a great improvement over the first valuation. In one lodge the surplus per member is £44·37; in another the deficiency is £28·92.

The Independent Order of Oddfellows (American Order) has been working under what is regarded as a sufficient scale for over twenty years, with the following result—

	Members	Ratio
		£
1st Valuation . . .	678	1·076
2nd „ . . .	1,007	1·074
3rd „ . . .	1,292	1·082

The position of this society, though very good, would have been better but for a series of unfortunate investments in halls some years ago. The officers are now wiser.

The position and prospects of the Ancient Order of Foresters may be judged by the following figures relating to four of the districts:

	Wellington District		Nelson District		Canterbury District		Otago District	
	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio
		£		£		£		£
1st Valuation . .	1,316	0·868	811	0·661	801	0·807	1,255	0·793
2nd „ . .	1,989	·909	569	·678	771	·853	1,231	·848
3rd „ . .	2,378	·856	616	·700	866	·973	1,608	·920
4th „ . .	2,734	·883	699	·764	...	...	...	...

From the above it would appear that this Order is not in so good a position as the Oddfellows, yet progress is being made. According to the latest returns, the number of courts with a surplus is 16 out of a total of 99. The average deficiency is about £6 per member.

The Independent Order of Rechabites have increased their membership from about 1,000 in 1882 to 1,458 in 1895, and the ratio of assets to liabilities from about £0·830 to £0·950.

The United Ancient Order of Druids, with a membership of 3,911, cannot be regarded as in a satisfactory position. Out of 39 lodges valued, all exhibit deficiencies with one single exception, the ratio of assets being about £0·800.

The remaining societies, such as the Sons and Daughters of Temperance; the Hibernian Catholic Benefit Society, and the Protestant Alliance Society, are not in a satisfactory position, the ratio of assets being about £0·675, and the rate of progress very slow. The Railway Benefit Societies exhibit deficits of £12·32 and £23·31 per member respectively, so that they must be regarded as in a dangerous position.

It is apparent from these results that the true significance of a large deficit has not been grasped by the members of several of the societies, and much remains to be done before all the branches can be

regarded as in a position to fulfil their engagements. Whether the State should insist on societies with a deficit taking immediate steps to remedy the same, is a question on which opinions are greatly divided, but we are of opinion that when a second or third valuation still shows the position to be perilous, some legal power should be available to enforce the necessary improvements to prevent ultimate disaster. During the last twenty years many lodges have improved their position greatly by the close and profitable investment of the funds, seven, eight and nine per-cent having been realised in a good many instances, over a number of years. But with the general fall in the rate of interest these rates cannot be looked for in future, and in consequence this source of profit will be diminished. Already some colonial life assurance associations have considered it prudent to reduce their valuation rate below four per-cent, and the same course may have to be followed in the near future, in connection with the valuations of friendly societies.

Sickness and Mortality Experience.

Ever since the Act of 1877 came into operation, much attention has been given by the Registrar and Actuary to the collection and publication of the sickness and mortality actually experienced by members of friendly societies in the colony. The first experience published was for the years 1873–77, the years of life under observation are 23,947, the number of deaths 174, and the sickness 19,243 weeks. According to this experience, the rates of sickness and mortality at the ages for which a considerable body of facts exists, are lower than those which obtain for the corresponding ages in England; at the same time, the Actuary—for reasons given at length—could not recommend the adoption of lower rates of contribution than those he had already submitted, or of less rigorous standards of valuation than those of which he had expressed approval.

The second experience was for the five years 1878–82, the years of life under observation being 32,213, the number of deaths 218, and the sickness experience 30,448 weeks. When the two experiences are combined, it is shown, that in respect of mortality, the rates compare very favourably with those of the following English mortality tables, namely, Farr's No. 3, the H^M, and the Ancient Order of Foresters. In respect of sickness, it is found that the percentage of members sick, and also the average number of weeks' sickness per member for the ages 20 to 50, compare favourably with the Manchester Unity and Foresters' experience, whereas the average number of weeks' sickness experienced per member sick is considerably higher among New Zealand societies, especially at the older ages. The Registrar concludes, however, that the experience is not yet sufficiently extensive to justify its adoption as a basis of calculation for contributions. Another feature of the sickness experience had been frequently adverted to by the valuers in their reports. It was this—that the proportionate distribution differed considerably from the English experience. In one society, for the period 1880–84, the average age being 36½, and the years of life at risk 7,344, the sickness experience was 8,080 weeks (against an expectation of 8,732 weeks), the proportionate distribution of every 100 weeks' sickness was as follows: first six

months, 56·22 weeks; second six months, 8·07 weeks; and after twelve months, 35·71 weeks. Whereas, by the Manchester Unity experience, the proportions should have been 76·08, 8·55, and 15·37 respectively. At subsequent valuations it is found that the divergence has increased, and also that the actual sickness has exceeded the expectation, the excess having been experienced at the advanced ages.

The experience of societies for the years 1883–86 is not available, because of the destruction of the records by a fire which took place in the office in 1887. In 1891, the Government decided to discontinue the then system of payment to public valuers for the quinquennial valuations, but in order that societies might continue to be relieved of the cost of valuation, they were given the option of having their valuations made in the office of the registrar. As was to be expected, this option has been almost universally taken advantage of, and as the experience of each society so valued had to be taken out for the five years' preceding valuation, the results are combined into an aggregate experience year by year, and published in the annual reports. In the report for 1897 (the twentieth), the combined sickness and mortality experience of societies valued in the office is given as follows:

Number of years of life at risk	70,558·5
Sickness (weeks) first six months	59,522
„ „ second six months	7,319
„ „ after twelve months	29,822
Total	96,663
Number of deaths of members	494
„ „ „ wives	287

Details of the above experience in respect of the age of members, &c., as given in the table hereunder, are extracted from the Registrar's report:

Sickness and Mortality Experience of Societies valued in the Office (Men Members only).

Age of Members	Number of Years of Life at Risk	Sickness (Weeks)				Number of Deaths	
		First Six Months	Second Six Months	After Twelve Months	Total	Of Members	Of Wives
Under 25 . . .	11,817·5	7,963	477	851	9,291	56	9
25–30	11,908·0	6,958	505	715	8,178	55	25
30–35	11,632·5	7,577	622	1,221	9,420	55	38
35–40	10,748·5	7,783	564	1,007	9,354	53	52
40–45	8,434·5	7,091	835	2,755	10,681	45	46
45–50	6,576·5	7,097	933	3,548	11,578	51	30
50–55	4,912·0	6,620	1,274	4,358	12,252	72	38
55–60	2,584·5	4,064	905	5,232	10,201	54	21
60–65	1,325·5	2,652	596	4,113	7,361	19	15
65–70	397·0	1,057	256	3,011	4,324	16	8
70 and upwards .	222·0	660	352	3,011	4,023	18	5
All ages . .	70,558·5	59,522	7,319	29,822	96,663	494	287

The averages deduced from the foregoing experience are as follows:

Age	Average Weeks' Sickness per Member per Annum				Death Rate per 1,000
	First Six Months	Second Six Months	After Twelve Months	Total	
Under 25	0·68	0·04	0·07	0·79	4·74
25–30	0·58	0·04	0·06	0·68	4·62
30–35	0·65	0·05	0·11	0·81	4·73
35–40	0·73	0·05	0·09	0·87	4·93
40–45	0·84	0·10	0·33	1·27	5·34
45–50	1·08	0·14	0·54	1·76	7·75
50–55	1·35	0·26	0·88	2·49	14·66
55–60	1·57	0·35	2·03	3·95	20·89
60–65	2·00	0·45	3·10	5·55	14·33
65–70	2·66	0·64	7·59	10·89	40·30
70 and upwards	2·97	1·58	13·57	18·12	81·08
All Ages	0·844	0·104	0·423	1·371	7·00

A close comparison of the above experience, with other data available, would be interesting, but we must rest content with a few comparisons of the total sickness, and of the rates of mortality.

Age	Weeks' Sickness per Member per Annum			Death Rate per 1,000		
	New Zealand Societies, 1887-95	M.U.I.O.F. England, 1866-70	Sutton's Friendly Societies' Experience, 1876-80	New Zealand Societies, 1887-95	New Zealand Male Population, 1880-92	M.U.I.O.F. England, 1866-70
Under 25	0·79	0·74	0·88	4·74	5·28	6·32
25–	0·68	0·81	0·87	4·62	5·39	7·62
30–	0·81	0·93	1·03	4·73	6·33	8·18
35–	0·87	1·06	1·24	4·93	7·44	9·77
40–	1·27	1·26	1·47	5·34	9·24	12·58
45–	1·76	1·64	1·89	7·75	11·98	14·29
50–	2·49	2·22	2·40	14·66	15·21	19·05
55–	3·95	3·05	3·35	20·89	21·68	24·92
60–	5·55	4·71	5·23	14 33	30·56	35·37
65–	10·89	7·24	8·87	40·30	46·13	52·09

From the foregoing, it will be seen that the average sickness compares favourably with the Manchester Unity Experience up to ages 40–45, and with Sutton's Friendly Societies Experience up to ages 50–55. At the higher ages the sickness is in excess, and this is what is to be looked for from the extremely low death rate which has hitherto prevailed. The following table (taken from the registrar's report) shows the proportionate distribution of the sickness in quinquennial age periods, and this will enable comparisons to be made with other data.

Age	Ratio (Per-Cent) to Total Sickness		
	First Six Months	Second Six Months	After Twelve Months
Under 25	85·71	5·13	9·16
25–30	85·08	6·18	8·74
30–35	80·44	6·60	12·96
35–40	83·21	6·03	10·76
40–45	66·39	7·82	25·79
45–50	61·29	8·06	30·65
50–55	54·03	10·40	35·57
55–60	39·84	8 87	51·29
60–65	36·03	8·10	55·87
65–70	24·45	5·91	69·64
70 and upwards	16·40	8·75	74·85

Viewing this experience as a whole, it appears to present certain features which may now be regarded in the nature of permanent characteristics, and there can be little doubt that if made the foundation for the calculation of rates of contribution or present values for estimating the sickness liabilities, an increase would be exhibited over the rates and values deduced from the Manchester Unity Experience. In consequence of this, great caution is necessary in dealing by way of appropriation with any surplus brought out by the present system of valuation.

In a short time the number of years of life at risk included in the experience will exceed 100,000, and when this number is reached it is considered that, so far as regarded reliable, it should be utilized in the foundation of the necessary tables for valuation and other purposes.

The subject of a superannuation allowance after 60 or 65 years of age in lieu of sick pay has been frequently debated by societies, especially in the Independent Order of Oddfellows and in several districts of the Manchester Unity. In fact, the Hawke's Bay district of this Order has had such a scheme in operation for over a year; it is optional as regards old members, but compulsory on all new members entering the district society. There is no doubt that the feeling in favour of superannuation allowances is growing in public favour rapidly, and, with increased knowledge of the subject, it is to be hoped members will be prepared to make the necessary sacrifice to secure the desired object. In this connection, it may be mentioned that a scheme of friendly society financial reform was outlined by the Registrar in September 1895 and submitted to the Colonial Treasurer.

In May 1897 a Royal Commission was appointed for the purpose of enquiring into the working of societies established or assisted by employers, and also generally into the working of private benefit societies, the relations existing between employers and employed in connection with such societies, and the expediency or otherwise of bringing such societies under legislative control. That no time was lost by the commissioners may be gathered from the fact that their report to the Governor is dated 30th July 1897. Sittings were held at Dunedin, Christchurch, Wellington, and Auckland; the affairs of 30 societies were enquired into, and altogether the evidence of 165 witnesses was taken. These societies had a membership of 5,366, and were

found to vary greatly in constitution, benefits, methods, and objects, but may be classed in two divisions as permanent and annually-terminating societies.

The commissioners state that it has been a source of great gratification to them to find so large an amount of thrift and self-reliance among the industrial classes of the colony. They recommend that, in the case of assisted or endowed societies, provision should be made for the representation of the employer on the governing body, but that in no case should this be permitted to be a preponderating influence; further, that all funds not required for immediate use as shall arise in respect to the contributions of members, should be invested in government securities or on mortgage on freehold security, subject to the approval of the Government valuer-in-chief.

They also state that "it is matter for consideration whether in the " case of the larger societies which provide sick pay, medical assistance, " funeral allowances, and have a surrender value, or any of these, it " should or should not be a condition of registration that the scale of " contributions is certified as actuarially sound."

Again, they state that "while of opinion that it is desirable that " legislative provision should be made to enable private benefit " societies to obtain legal recognition and status, at the same time they " recognize the undesirableness of attempting to impose conditions of " an irksome character involving either undue trouble or expense . . . . " and they fail to see how it would be possible to compel such societies " to discontinue operations while unregistered. All that your com- " missioners think it possible to effect by legislation is to provide a " simple and inexpensive means for securing to such societies as " voluntarily take advantage thereof the benefit of obtaining legal " recognition as societies coming within the provisions of an easily- " understood statute."

As yet no legislative action has been taken on this report, and many persons well qualified to judge think that some slight amendments in the present Friendly Societies Act would cover all the recommendations of the Commissioners which it is desirable, or indeed possible, to give effect to under present conditions.

Discussion *of Papers Submitted on the Position of Friendly Societies in Various Countries.*

The President, in opening the proceedings before the papers of the day were submitted, said that he need not, at that early stage, make any lengthened remarks upon the vast importance of the subject of the day—the Position of Friendly Societies in Various Countries—not merely from the point of view of the Actuary, but also essentially from the point of view of the social prosperity, and, indeed, the stability, of every country in which these organizations existed. The subject was one not simply of permanent interest, but also of varied interest, and that appeared to him to afford one of the most striking signs of the importance of a Congress like the present—that by bringing together the facts and information regarding the constitution and regulation of these bodies in all countries into, so to speak, one focus, it seemed to him that that Congress would be attended with exceptional benefit—with benefit they could not otherwise secure,—for future discussions and deductions upon the question.

M. Duboisdenghien (Belgium), in submitting his paper on Friendly Societies in Belgium, said:

In placing on the programme of the Congress the question of Friendly Societies, the Organizing Committee intended, I think, that the Congress should obtain information on the position and tendencies of these societies in each country.

I therefore think it desirable to complete my report, in so far as Belgium is concerned, by a few indications of the tendencies which are there manifested.

In Belgium a controversy has been initiated between the mutualists and the actuaries. So far, it has been conducted in a courteous manner, and has been far from reaching that degree of acrimony which has prevailed in some countries, where even the gratuitous opinion has been expressed that the actuaries are the foes of mutualists.

Mutualists and actuaries have

En portant au programme du Congrès la question des sociétés de secours mutuels, le Comité Organisateur a désiré, je pense, que le Congrès obtienne des renseignements au sujet de la situation et des tendances de ces sociétés dans chaque pays.

Je crois devoir compléter mon rapport, en ce qui concerne la Belgique, par quelques indications sur les tendances qui s'y manifestent.

En Belgique, les discussions viennent d'être entamées entre mutualistes et actuaires. Jusqu'à présent, elles sont restées courtoises, et sont loin d'atteindre le degré d'acuité que l'on a observé dans certains pays, où l'on a été jusqu'à émettre cette opinion toute gratuite que les actuaires sont les ennemis de la mutualité.

Mutualistes et actuaires, en Belgique, ont adopté un terrain commun

adopted in Belgium a common ground of discussion. Both admit that Friendly Societies must before all things be provident institutions, and only incidentally benevolent institutions. The contract benefits must be met only from the resources arising from the contributions of the benefit members, resources which constitute that which may be called the ordinary fund. Should there be extraneous resources (donations, subsidies, proceeds of fêtes, contributions of honorary members), these must be carried to special funds, for the purpose of providing, without any rigidly defined rules, assistance not included in the contracts—grants to widows and orphans of deceased members, and supplementary grants to those members who have exhausted their right to ordinary benefits, &c.

By reason of its ordinary fund a friendly society is a provident institution, and by reason of its extraneous funds it practices benevolence. But there is a unanimous opinion in Belgium as to the necessity of keeping strictly separate the ordinary and the extraneous funds. Nevertheless, even if the need for this separation be admitted in theory, it must be granted that many societies do not carry the theory into practice. What mutualists appear to deny is the very advantages of the principles of actuarial science, when the attempt is made to apply these to friendly societies. They resent the introduction into the operations of these societies of methods depending on the application of tables of mortality and sickness; they adhere to general averages. The fundamental principles of the methods of actuarial science are attacked; and the task is a hard one for Belgian actuaries to repel the assault of the mutualists. These, carried away by their ideal, enthusiastic as to the results so far of their vigorous propaganda (which we cannot but admire because it is generally disinterested) defend their work with vehemence. They assert that the future is secured: that the future has not been sacrified to the present. The actuaries, on the other hand, gravely doubt the future, and raise questions as to the teaching of that experience hitherto,

de discussion; les uns comme les autres admettent que les sociétés de secours mutuels doivent être, avant tout, des institutions de prévoyance, et, accessoirement, des institutions de bienfaisance. Les indemnités statutaires doivent être payées au moyen des seules ressources provenant des cotisations des membres effectifs, ressources qui alimentent ce qu'on appelle le fonds ordinaire. S'il existe des ressources extraordinaires (dons, subsides, produits de fête, cotisations de membres honoraires), elles alimentent le fonds extraordinaire, qui doit servir à payer, sans règle bien déterminée, des secours non prévus statutairement, des indemnités aux veuves, aux orphelins des membres décédés, des secours complémentaires à ceux des membres qui ont épuisé leurs droits aux secours ordinaires, &c.

Par son fonds ordinaire, une société de secours mutuels est une institution de prévoyance, et par son fonds extraordinaire, elle pratique la bienfaisance. Mais il y a unanimité d'opinion en Belgique relativement à la nécessité de séparer nettement le fonds ordinaire du fonds extraordinaire. Cependant, si l'on admet cette séparation en théorie, on doit constater que de nombreuses sociétés ne l'appliquent pas. Ce que nos mutualistes paraissent nier, c'est la valeur même des procédés de la science actuarielle quand on veut les appliquer aux sociétés de secours mutuels; ils repoussent l'introduction dans le fonctionnement des sociétés, de méthodes reposant sur l'application de tables de mortalité et de morbidité; ils s'en tiennent à des moyennes générales. C'est l'essence même des solutions fournies par la science actuarielle qui est combattue, et la tâche est rude pour les actuaires belges de subir l'assaut des mutualistes; ceux-ci, imbus de leur idéal, enthousiastes des effets produits jusqu'à présent par leur active propagande, qu'il convient d'admirer, car elle est généralement désintéressée, défendent leur oeuvre avec acharnement; ils prétendent que l'avenir est assuré, que l'avenir n'a pas été sacrifié au présent. Les actuaires, au contraire, redoutent l'avenir, et contestent la portée de l'expérience faite jus'quà

which is invoked by the mutualists to justify adhesion to present methods.

In order to test the past of these societies, I have thought it well to prepare tables enabling us to take account of the fluctuations in their various assets. These tables are given in my report; and an examination of them leads to the conclusion that, with the great majority of our societies, especially the oldest, the *ordinary income* is exceeded regularly by the *ordinary outgo*, and that they remain in existence only by the application of large special resources outside those provided by the members, or by violent fluctuations in their membership. The past of our societies is therefore not always reassuring.

To forecast their future I have prepared for three of them, frequently adopted as models in Belgium, valuation balance-sheets, giving on the debit side their actuarial liabilities.

This triple experience scarcely harmonizes with the optimistic opinions of the practical mutualist. This fact becomes apparent on examining the balance-sheets given in my report.

Yet our mutualists are not convinced. They refuse to admit that friendly societies can be compared to assurance institutions. They quote certain clauses in the rules of the societies, which enable them to reduce or even to abolish the benefits in the event of insufficiency of receipts. Mutual associations, they say, are malleable, elastic institutions, subject to changes which every one will accept. Once again experience contradicts this statement, because too often we see a society become bereft of its members as a result of a resolution to reduce the benefits or to increase the contributions. Such measures are evidently discouraging to the members, and many of them lose confidence.

It goes without saying that, if our societies interpret literally the rule permitting them to change the benefits promised, they must admit that they do not undertake obligations in the true sense of the word, and they cannot say that they really grant assurances, because assurance implies, on the part of the assurer, a formal contract.

présent, et qui est invoquée par les mutualistes pour justifier le maintien des procédés actuels.

En vue de sonder le passé des sociétés, j'ai cru bien faire de former des tableaux permettant de se rendre compte des fluctuations de leurs divers éléments actifs. Ces tableaux figurent dans mon rapport; leur examen conduit à la conclusion que la grande majorité de nos sociétés, les plus anciennes surtout, voient leurs *recettes ordinaires* dépassées régulièrement par les *dépenses ordinaires*, et ne se maintiennent que grâce à l'appoint de ressources extra-sociales importantes, ou à des variations brusques dans leur population. Le passé de nos sociétés n'est donc pas toujours rassurant.

Pour apprécier leur avenir, j'ai dressé, pour trois d'entre elles dont le type est fréquemment adopté en Belgique, le bilan technique, comprenant au passif leurs réserves mathématiques.

Cette triple expérience ne concorde guère avec les opinions optimistes de nos mutualistes pratiquants; on pourra s'en convaincre à l'examen des bilans qui figurent dans mon rapport.

Pourtant nos mutualistes ne sont pas convaincus. Ils se refusent à admettre que les sociétés de secours mutuels puissent être assimilées à des organismes d'assurances; ils invoquent certain article des statuts des sociétés, qui leur permet de réduire et même de supprimer les secours en cas d'insuffisance d'encaisse. Les associations mutuelles, disent-ils, sont des organismes malléables, élastiques, sujets à des variations que tout le monde acceptera. Encore une fois, l'expérience s'inscrit en faux contre cette affirmation, car on a vu trop souvent une société se dépeupler, à la suite d'une décision réduisant le montant des indemnités ou augmentant la cotisation: pareilles mesures sont évidemment décourageantes pour les membres, et bon nombre d'entre eux perdent confiance.

Il va de soi que si nos sociétés interprètent strictement l'article de leurs statuts leur permettant de modifier les indemnités promises, il faut convenir qu'elles ne prennent pas d'obligations dans le vrai sens du mot, et qu'on ne

Nevertheless, the Belgian law of 1894, the old law of 1851, and the Reports to Parliament regarding these laws, frequently employ the word *assure* to designate the operations of mutual societies; and if the registered societies increase in number (at the end of 1895 there were 752 of them, while now there are more than 1,500), it is because, in the fierce propaganda going on in Belgium in favour of mutual aid, it is urged on the workmen, the lower grade of clerks, &c., that membership of a friendly society is the best means of providing against the risk of sickness, of *assuring*, in fact, against that risk.

The mutualists in question, who reject actuarial principles, and defend the methods actually being followed, that is to say, the absence of all real calculations, extend unduly, it seems to us, the intention of the restrictive rule of the societies, which permits of reducing the benefits promised in the event of there being insufficient receipts. In reality, this restriction has in view only events beyond control, such as epidemics, and in this sense only has it been understood by the members of the societies so far.

What I have just said shows that the adoption of scientific methods in the organization of friendly societies in Belgium meets with strong opposition from those who are most interested in the matter.

I call attention in my report to the characteristic tendencies which are to be found in official circles. The Belgian law of 1894 lays on Government the duty of preparing tables for the risks undertaken by friendly societies (tables of mortality and sickness). The Permanent Commission of Friendly Societies must, in virtue of the provisions of this same law, include two actuaries. Messrs. H. Adan and Bégault are members in this capacity of the Commission, which includes also in its membership a not less renowned actuary, M. Lepreux, in his capacity of General Manager of the Caisse Générale d'Epargne et de Retraite.

The last report of the Permanent Commission contains emphatic state-

peut dire qu'elles font réellement de l'assurance, car l'assurance implique de la part de l'assureur un engagement formel.

Cependant la loi belge de 1894, la loi ancienne de 1851, et les exposés de motifs à l'appui de ces lois, emploient frequemment le mot *assurer* pour caractériser les opérations des sociétés mutualistes, et si les sociétés reconnues se multiplient (elles étaient à la fin de 1895 au nombre de 752, et on en compte actuellement plus de 1,500), c'est que dans la propagande intense qui s'observe en Belgique en faveur de la mutualité, on présente aux ouvriers, aux petits employés, &c., l'affiliation aux sociétés de secours mutuels comme le meilleur moyen de se garantir contre le risque de maladie, de *s'assurer*, en somme, contre ce risque.

Les mutualistes en vue, qui repoussent l'organisation technique, et défendent les procédés actuellement mis en œuvre, c'est-à-dire l'absence de tout calcul sérieux, étendent indûment, selon nous, la portée de l'article restrictif des statuts des sociétés, qui permet de diminuer les indemnités promises en cas d'insuffisance d'encaisse; en réalité, cette restriction ne vise que les cas de force majeure, les cas d'épidémie, par exemple, et c'est bien ainsi que les adhérents à ces sociétés l'ont compris jusqu'à présent.

Ce que je viens de dire montre que l'adoption de méthodes scientifiques dans l'organisation des sociétés de secours mutuels en Belgique rencontre une forte opposition de la part de ceux qui sont le plus intéressés à la question.

J'ai signalé dans mon rapport les tendances caractéristiques qui s'observent dans les milieux officiels. La loi belge de 1894 impose au Gouvernement la charge de dresser des tables de risques à l'usage des sociétés mutualistes (tables de mortalité et de morbidité); la Commission Permanente des Sociétés Mutualistes, en vertu de cette même loi, doit comprendre deux actuaires. MM. H. Adan et Bégault font partie à ce titre de cette Commission, qui compte aussi parmi ses membres un actuaire non moins distingué, M. Lepreux, à titre de Directeur-Général de la Caisse Générale d'Epargne et de Retraite.

ments on the subject of the need of applying to the operations of friendly societies scientific principles.

We have the firm hope that these statements, emanating from an authority so high, will yield their fruit, and that our mutualists will, in the end, understand that the work which is so dear to them will only gain by being based upon solid and rational foundations.

Le dernier rapport de la Commission Permanente contient des déclarations catégoriques, au sujet de la nécessité de soumettre l'organisation et le fonctionnement des sociétés de secours mutuels à l'observation des principes scientifiques.

Nous avons le ferme espoir que ces déclarations, émanant d'une si haute autorité, porteront leurs fruits, et que nos mutualistes finiront par comprendre que l'œuvre qui leur est si chère ne pourra que gagner en s'appuyant sur des bases solides et rationnelles.

In submitting Mr. Unger's paper, Dr. Grosse (Germany) said:

The paper submitted by Mr. Unger, and now in your hands, on the whole question of workmen's insurance in Germany, based on Imperial legislation, gives a general and lucid view of what has been done by us in this direction up to the present time, by means of legislation. Mr. Unger, being prevented by his official engagements from taking personal part in the discussions of the Congress, I have undertaken to say a few words in introducing his paper.

In this connection, however, I wish at the outset to make a disclaimer. Mr. Unger is a defender, even an admirer, of the system of compulsory assurance carried out by the State. I do not think that many in this assembly will feel disposed to follow him in this direction. At any rate, speaking for myself personally, I do not. I am still convinced that, by wisely guiding the economic education of a free people, the same end may be reached by a much more pleasant road. Yet it cannot be denied that in Germany great results have been achieved, and the work of Mr. Unger is exceedingly noteworthy, because, in so far as the organization and the statistical basis of workmen's assurance, as provided by legislation, are concerned, it contains, at any rate for the uninitiated, all that need be known.

I had intended to submit a few observations on free friendly societies (*i.e.*, societies not under Imperial legislation.) This intention has, however, unfortunately been frustrated, because there is no information obtainable regarding these societies.

Der Ihnen vorliegende Bericht des Herrn Unger über das gesammte auf reichsgesetzlicher Grundlage beruhende Arbeiterversicherungswesen in Deutschland giebt Ihnen ein umfassendes und klares Bild dessen, was bisher auf diesem Gebiete bei uns *im Wege der Gesetzgebung* geschaffen worden ist. Da Herr Unger selbst durch seine amtliche Tätigkeit verhindert ist, an den Verhandlungen des Congresses Teil zu nehmen, habe ich es übernommen, seiner Arbeit einige erläuternde Worte zu widmen.

Hierbei muss ich nun allerdings von vorn herein einen Vorbehalt machen. Herr Unger ist ein Verteidiger, ja ein Bewunderer, des Systems der Zwangsversicherung durch den Staat. Ich glaube nicht, dass viele Mitglieder dieser Versammlung geneigt sein werden, ihm hierin zu folgen. Ich für meine Person jedenfalls nicht. Ich habe noch heute die Ueberzeugung, dass durch die richtig geleitete wirtschaftliche Erziehung eines freien Volkes sich dasselbe Ziel auf einem angenehmeren Wege erreichen lässt. Trotzdem lässt sich nicht verkennen, dass in Deutschland grosse Resultate erzielt worden sind und die Arbeit des Herrn Unger ist in hohem Grade dankenswert, weil sie bezüglich der Organisation und der Statistik der auf reichsgesetzlicher Grundlage beruhenden Arbeiter-Versicherung besonders für Fernerstehende alles Wissenswerte enthält.

Ich hatte die Absicht, Ihnen einige Mitteilungen über die freien (*d.h.* nicht der Reichsgesetzgebung unterwor-

In Prussia we do not even know their number.

The work of Mr. Unger is in four sections. He commences (*a*) by describing the rise and progress of Imperial legislation on workmen's insurance, and then he deals separately with—

(*b*) Sickness Insurance,
(*c*) Accident Insurance,
(*d*) Insurance against Old Age and Infirmity,

in so far as they are regulated by Imperial legislation.

fenen) Hilfskassen zu machen. Die Ausführung dieses Planes ist leider daran gescheitert, dass es an jeder Statistik dieser Hilfskassen fehlt. In Preussen wissen wir nicht einnal die Zahl derselben.

Die Arbeit des Herrn Unger enthält vier Teile. Zunächst schildert er die Entstehung und den Gang der Reichsgesetzgebung über Arbeiter-Versicherung und dann behandelt er einzeln—

(*b*) Die Krankenversicherung,
(*c*) Die Unfall-Versicherung,
(*d*) Die Alters-und Invaliditäts-Versicherung,

soweit sie eben durch die Gesetzgebung desReiches geregelt sind."

When all the foregoing papers had been submitted, the President, in opening the discussion, said that the subject of friendly societies had always possessed peculiar interest in this country from the days of Mr. Charles Ansell to the present day, and the contributions of actuaries to the scientific and practical consideration of the question had been both numerous and useful. It had also engaged, to a considerable extent, the attention of the Legislature, but with very meagre success, as the list of Acts which either repealed or abrogated preceding Acts very unhappily evidenced. The permanent difficulty that he had himself discovered in the practical adminstration of these societies, and especially when measures of reform were submitted, was the extremely imperfect condition of the knowledge of the average member, who entirely failed to appreciate the difficulties of adminstration, and thence to insist upon the application of those principles of effective remedy which the actuary was constantly attempting to supply. It appeared to him that one permanent and extremely beneficial result of the present Congress would be that, by concentrating information from different countries, they should become enlightened upon the subject from every possible aspect, and they would thus have the means placed in their possession of endeavouring to educate the average members of these friendly societies into a practical recognition of the principles which underlie their successful administration.

Dr. Christian Moser (Switzerland) said:

We all join in thanking the writers of papers who have interested us by their contributions, some of which are really remarkable.

As to friendly societies in Switzerland, I may state first of all that we possess a large number in that country; and, if we may judge from existing associations, the Swiss evidently possess a very pronounced taste for mutual aid. It could scarcely be otherwise in a country whose fundamental constitution, historical and ancient, consists in the practical application of the principle of mutual assistance, shown in the name of the country, "Swiss Confederation."

Jeder von Ihnen schliesst sich wohl der Dankesbezeugung für die Herren Berichterstatter an, die uns mit zum Teil ganz ausgezeichneten Arbeiten erfreut haben.

Was nun die gegenseitigen Hülfsgesellschaften (Sociétés de secours mutuels) in der Schweiz anbetrifft, so konstatiere ich vor allem, dass wir deren in der Schweiz eine grosse Zahl besitzen und das dem Schweizer, hiernach zu schliessen, offenbar ein ausgesprochener Sinn für gegenseitige Hülfeleistung innewohnt. Es kann dies kaum anders sein in einem Lande, dessen wesentlichste, vielhundertjährige, geschichtliche Grundlage in der Ausführung des

On the other hand, there does not yet exist in Switzerland any special legislation for friendly societies.

True, sickness and other societies can have their names entered in the Commercial Registry as co-operative societies or associations. Then the provisions of the Swiss Code relating to such associations become applicable to them.

As to the actuarial basis of friendly societies, it cannot be denied that within the last few decades there has been great improvement, thanks to the efforts of a few men, among whom may be prominently mentioned Professor Dr. Kinkelin, of Bâle, as also the Director of the Federal Assurance Department, Dr. Kummer. Funeral societies have frequently sought and obtained affiliation with larger and stronger assurance institutions, or have been reorganized and united, as has just been done, with State assistance, in the Canton of Neuchâtel.

And before taking leave of this part of the subject, it will no doubt be gratifying to you to learn that Dr. Kinkelin's coefficients, referred to in the paper of Mons. Duboisdenghien, have lately been revised in Switzerland. I shall be happy to supply the table of the revised coefficients to any members of the Congress who are good enough to apply to me.

The projected measures regarding compulsory assurance against sickness and accidents, the debate upon which will shortly be concluded by the two Chambers, the National Council and the Council of the States, contain several special provisions regarding existing friendly societies, particularly regarding those which assure against sickness. For these latter it is intended that there shall be a Government subsidy; but I shall not dwell on this point or on others, seeing that time is so limited.

In conclusion, I wish to emphasize this point: As regards the legislation just mentioned, it has been remarked that Swiss friendly societies are very determined to maintain their existence, and have urged their views with earnestness and skill upon the legislative authorities; and that in general

Princips der gegensseitigen Hülfeleistung besteht—ein Umstand, der sich schon im Namen des Landes: Schweizerische Eidgenossenschaft, Confédération suisse, kundgiebt.

Ein Spezialgesetz für die gegenseitigen Hülfsgesellschaften dagegen existiert zur Stunde in der Schweiz nicht.

Allerdings können sich die Kranken- und andern Hülfskassen als Genossenschaften oder als Vereine in das Handelsregister eintragen lassen. Dann gelten für sie die bezüglichen Bestimmungen des schweizerischen Obligationenrechts.

Was die technischen Grundlagen der gegenseitigen Hülfsgesellschaften anbetrifft, so darf nicht verkannt werden, dass in den letzten Decennien vieles besser geworden ist: Dank den Bemühungen einer Anzahl von Männern, unter denen ich vor allen Herrn Prof. Dr. Kinkelin in Basel sowie den Direktor des eidg. Versicherungsamts, Herrn Dr. Kummer, nennen will. Die Sterbekassenvereine haben vielfach Anschluss an solide grössere Versicherungsgesellschaften gesucht und gefunden, oder haben sich reorganisiert und auch vereinigt, wie dies, mit staatlicher Hülfe, soeben im Kanton Neuenburg geschieht.

Da ich gerade bin den technischen Grundlagen bin, so ist man mir wohl dankbar, wenn ich bemerke, dass die Kinkelin'schen Koeffizienten in dem Bericht von Herrn Duboisdenghien neulich in der Schweiz revidiert wurden. Ich will die Tafel der revidierten Koeffizienten gerne an die Mitglieder des Congresses senden, die die Freundlichkeit haben sich an mirch zu wenden.

Die Entwürfe für die obligatorische Kranken-und Unfallversicherung, Entwürfe die in der nächsten Zeit von beiden Kammern, dem Nationalrat (Conseil national) und dem Ständerat (Conseil des États), zu Ende beraten sein werden, enthalten einige spezielle Bestimmungen über die gegenseitigen Hülfsgesellschaften, und zwar über die gegenseitigen Hülfsgesellschaften, die die Krankenversicherung betreiben. Es wird für diese unter anderem auch eine staatliche Subvention in Aussicht genommen; doch will ich hierauf, sowie

they are distinguished by an active and vigorous life, at which we cannot but rejoice.

M. Lepreux (Belgium) said that, in the domain of Friendly Societies, as in all others relating to assurance, English legislation was inspired by an absolute respect for liberty. Nevertheless, registered Friendly Societies must submit their accounts each year to a competent person, who draws up a comparison between the expenditure and the receipts for each of them, so that those interested may make themselves acquainted with the conditions of working of the Society to which they belong. This system possesses important advantages. M. Duboisdenghien, in his recent work, has pointed out the uncertain position in which Belgian actuaries are at present placed; how, in spite of their efforts, it may be said that Belgian mutualists are determined still to follow the dangerous path in which they are walking from the fact that there is absent all proper and scientific relationship between the contributions and the benefits. The law of 1894 has certainly effected some improvement in the position of Belgian Societies, but more must be asked for. The requirements made by Belgian actuaries may be summarized as follows:

The law of 1894 has ordered the construction of Risk Tables (Mortality and Sickness). These Tables, it is scarcely necessary to say, cannot be prepared in a brief interval of time. Yet some statistical information has been collected, and it is to be hoped that this important question will soon be settled.

auf weitere Punkte, mit Rücksicht auf die kurz bemessene Zeit, nicht des Nähern eintreten.

Ich will zum Schlusse nur noch eines betonen. Bei der soeben erwähnten Gesetzgebung hat man die bemerkenswerte Beobachtung gemacht, dass die gegenseitigen Hülfsgesellchaften in der Schweiz mit grosser Energie an ihrem Fortbestehen halten, ihren Standpunkt mit zäher Ausdauer und mit Geschick bei den gesetzgebenden Behörden vertreten haben und sich im allgemeinen durch ein aktives reges Leben auszeichnen, dessen wir uns gewiss nur freuen können.

M. Lepreux (Belgique) dit que, dans le domaine des sociétés de secours mutuels, comme dans toutes les autres questions relatives à l'assurance, la législation anglaise s'inspire du respect absolu de la liberté. Toutefois, les societés de secours mutuels enregistrées doivent soumettre chaque année leurs comptes à un homme compétent, qui établit une comparaison entre les charges et les ressources de chacune d'entre elles, de telle façon que les intéressés peuvent se rendre compte des conditions de fonctionnement de la société à laquelle ils appartiennent. Ce système présente les plus serieux avantages. M. Duboisdenghien dans son travail recent, a montré la situation incertaine en face de laquelle les actuaires belges se trouvent en ce moment; comment, en dépit de leurs efforts, on dirait que les mutualistes belges sont déterminés à rester dans la voie dangereuse dans laquelle ils se sont engagés, par le fait de l'absence d'une relation convenable et scientifique entre les cotisations et les indemnités.

La loi de 1894 a certainement apporté quelques améliorations dans la situation existante des sociétés belges, mais il faut demander davantage. Ce que demandent les actuaires belges peut être résumé comme suit; la loi de 1894 a prescrit l'établissement de tables de risques (mortalité et morbidité). Ces tables, il n'est pas nécessaire de le dire, ne peuvent être élaborées en un court espace de temps. Toutefois quelques documents statistiques ont été réunis, et il est à espérer que cette

The Congress is aware that there exists in Belgium a Permanent Commission for Friendly Societies. The actuaries who are members of that Commission desire that model rules, meeting scientific requirements, should be formulated for those which may adopt them, so that Friendly Societies may be enabled, if they wish it, to transact real assurance. Provided with these rules, the Permanent Commission, fulfilling the functions confided to it, could recommend the adoption of rules meeting the scientific exigencies of a Society of this kind.

In the third place, Friendly Societies frequently transact life assurance business, but often under conditions which are entirely empirical; and those who make themselves familiar with the work of M. Duboisdenghien, will doubtless be surprised to learn the serious liability weighing upon them. To remedy these evils, the Assurance Fund, attached to the Pension Fund established under State guarantee, has been empowered to transact life assurance business, without medical examination, but on condition that the affiliation of the members shall be general, and carried out under a formal provision of the Society's rules.

The efforts of the Belgian actuaries have received an outside acknowledgment by the publication of the work of M. Duboisdenghien, which M. Lepreux had much pleasure in mentioning to the Congress.

In conclusion, M. Lepreux acknowledged that in England, the home of liberty, the legislator had prescribed certain special measures, adapted to the national temperament, which seemed to be of a kind to obviate the dangers which in some other countries might follow from too much freedom.

Le Congrès sait qu'il existe en Belgique une Commission Permanente de sociétés de secours mutuels. Les actuaires qui font partie de cette Commission désirent que des statuts-modèles, répondant aux exigences scientifiques, soient élaborés pour ceux qui s'y affilient, et que les sociétés de secours mutuels soient aptes, si elles le veulent, à faire véritablement de l'assurance. Pourvue de ces statuts, la Commission Permanente, remplissant les fonctions dont elle a été investie, peut recommander l'adoption de statuts répondant aux exigences techniques d'une Société de l'espèce.

En troisième lieu, les sociétés de secours mutuels font souvent de l'assurance sur la vie, mais suivant des règles entièrement empiriques, et celles qui auront pris connaissance du travail de M. Duboisdenghien seront sans doute surprises de connaître l'importance des charges qui pèsent sur elles. Pour remédier à ces inconvénients, la Caisse de Retraite instituée sous la garantie de l'Etat a été autorisée à traiter des opérations d'assurance sur la vie, sans examen médical, mais à la condition que l'affiliation des sociétaires soit générale, en vertu d'une disposition formelle des statuts de la Société.

Les efforts des actuaires belges ont reçu une manifestation extérieuse par la publication du travail de M. Duboisdenghien, que M. Lepreux signale avec plaisir au Congrès.

En terminant, M. Lepreux constate qu'en Angleterre, pays de liberté, le législateur a prescrit certaines mesures spéciales s'adaptant au tempérament national et qui semblent de nature à obvier aux dangers, que dans certaines pays trop de liberté pourrait entraîner.

Mr. Adler (London) said that he had for a great many years taken an interest in friendly societies prior to the legislation of 1875; and as he had also been a public valuer for a good number of years, he could speak with some little experience as to the system as it obtains in England. It would appear that, if we include the eight millions which the Chief Registrar enumerated as insuring in friendly societies in England, and add to that number those who are insured in industrial companies which do not make their return to the Chief Registrar, but which make their report to the Board of Trade, there are really insured in England, under the voluntary system, more than the 18 millions mentioned by the Germans; and that, he thought, should be a source of

satisfaction, inasmuch as, while the population of Germany is 52 millions, that of England is a great deal less. He would take the opportunity of very briefly contrasting the two nations in respect to insurance. In Germany there is compulsion, and in England it is just the reverse. In England, in 1870, there was legislation passed covering insurance companies, and in 1875 further legislation was passed dealing with friendly societies. Now, practically, the legislation in both cases is to the same effect, namely, the rendering of annual accounts and results of the quinquennial valuations. These annual accounts and these quinquennial results are, in the case of insurance companies, sent in to the Board of Trade, and at the meeting of the Congress on the previous day it had very properly been said that this had worked very well in connection with English insurance companies. It has worked very satisfactorily indeed, and there is, in fact, only one fault to be found, namely, the loss of time that occurs—very often even 10 or 12 months are allowed to lapse before the returns find their way into the Blue Book. But in the case of friendly societies it is worse; because, whilst the annual accounts are given yearly, the result of the valuation—which is the important point—is given only at quinquennial periods, and then it is given in an appendix of the Chief Registrar's report, which is not easily available. Probably copies of that report are not even kept regularly in the library of the Institute! Well, who are the people concerned? The working classes. And even if these returns were within their reach, they would not be very much wiser. But there is a clause in the Act of 1875 enjoining upon friendly societies the obligation of putting up the annual returns, and also the actuary's quinquennial valuation report, in a conspicuous place, for the inspection of the members. Now, it is true that a technical return, such as an actuary has to give, is not one that, generally speaking, the working classes could follow. Still, if that requirement were insisted upon—if, at the several meeting places of these societies this information were prominently brought under the notice of the members—they would not be able to complain and say, "We don't know anything about the position of our society, and whether or not it is solvent." He was afraid that very little could be done towards bringing these results prominently before the various members of these societies. As it is, they are put to considerable expense in order to enable the valuation to be made, and when the valuation is made, there is no practical result arrived at. In the case of insurance companies, valuation returns find their place in the Blue Book; and one has only got to turn the pages to see which companies are in a satisfactory condition and which are not. But in the case of friendly societies there is nothing of the kind, and he thought it was a very pitiable thing that this great work leads practically to little result. Although the affiliated societies, numbering their millions of members, have been getting, step by step, into a more satisfactory condition, and are getting more and more near to a state of solvency, yet thousands of smaller societies are in a very unsatisfactory position; and, worse than all, they hardly know it or realize it. That is a point which it behoves those who have influence to call attention to. The interest of these eight million members, at all events, who are insured in friendly societies, should be safe-guarded, and he felt bound to say that the working of the Friendly Societies' Acts contrasts in an unsatisfactory way with the working of the Life Assurance Companies Acts.

Mr. F. G. P. Neison (London) said that there had been nine papers dealing with the important question of friendly societies, and the point which struck him more than any other was that, so far as friendly society organizations are concerned, the experience of foreign countries has been pretty similar in character to what has been our own. In the development of thrift in this country, the friendly societies had to pass through various stages; and so far as foreign countries are concerned, from the papers which have been submitted, it would appear that the organizations there are suffering from what might be termed the

infantile series of diseases. For example, complaints are made of the want of graduation of the premiums; also, of lack of information as to the intensity of chronic sickness. Likewise, as far as the pensions are concerned, a great many of the organizations have had to revise their assumption that, by the interposition of Providence, certainly not more than 5 per-cent of the members would ever see 65 years of age. So far, too, as widows' and orphans' funds are concerned, it has taken long to impress upon the members that the widows have so little regard for the affectionate memory of their husbands as not to die at a less period than an average of 15 years after their husband's decease. Many of these funds were started on the assumption that no decent widow would think of surviving her husband by more than two years; and naturally all these widow and orphan funds have come to grief. These difficulties were felt by our own Government, and in 1825 a special commission of experts, comprising all the best actuarial knowledge of the day, was appointed to see what were the best remedial measures. One of the conclusions they arrived at was that the only way to deal with the system was to insist that no society should be started unless it had its rules determined by the best actuarial talent of the day. Well, a statute to that purport was passed, and many other statutes up to 1846 were passed of a similar character, but though the societies had the opportunity of availing themselves of this expert knowledge, unfortunately experience shows that they neglected to do so. In fact, it was the wrong way to remedy the disease. The only way in which the defects in friendly societies can be remedied, is by so instilling into the members a knowledge of the requirements of reform, that they will be led to adopt the necessary measures themselves. The greatest success, so far as friendly society reform in this country is concerned, was achieved in the early forties, when, in consequence of the vehement attacks which were made then upon what was the largest organization of its kind—the Manchester Unity of Oddfellows—the society itself took action. The members thought that really for the attacks to be so vehement, there must be some grain of truth in them. What was the consequence? They immediately set to work and got together the returns from their different branches, and arrived at the conclusion that really there was sound and substantial justice in the attacks which had been levelled against them. The result was, that from that day to this, the Manchester Unity of Oddfellows has steadily progressed in all directions, until at the present time we know that if it is not actually solvent in all its branches, in a large majority of them they have nothing whatever to be ashamed of. Bearing in mind that, so far as this country is concerned, no real reform was possible until the members took up the matter themselves, it is remarkable to learn, from the papers that have been read, of the want of opportunity of the members of friendly societies in foreign countries to apply the same mathematical laws in their organizations as the working class organizations of this country possess. Until the working classes of these other countries have the same facilities of being informed of the laws of sickness and mortality as they have in this country, there is not much hope of any real reform in their friendly society organizations.

Mons. Léon Marie (France) said that he recognized, with regret, that mutualists, at least in France, are deeply divided, and separated into two almost hostile camps. One party desires to introduce the control of the actuary into even the smallest details of the working of the friendly societies, while the other party rejects altogether that control, and leaves everything to chance. The speaker thought that both these extreme opinions are deserving of censure.

M. Léon Marie constate avec regret que les mutualistes sont, au moins en France, profondément divisés, et séparés en deux camps presque ennemis. Les uns veulent introduire le contrôle scientifique de l'actuaire jusque dans les moindres détails du fonctionnement des sociétés de secours mutuels; les autres repoussent absolument ce contrôle, et livrent tout au hasard. L'orateur pense que ces deux opinions extrêmes sont également sujettes à la critique.

The intervention of the actuary should be regarded as indispensable, but it must be confined within wise limits.

Friendly societies may, moreover, be divided into three classes which require distinctive treatment.

In the first of these classes must be placed those societies whose object is to assure against accidents and loss of employment, leaving out of account the charge for a pension to these victims. Here, each year forms a complete financial cycle, the income and outgo of which can be equated. It is impossible for the society to survive if it do not receive sufficient to meet its expenditure. Scientific control is, therefore, almost superfluous in such cases, and can only be required to apportion the charges amongst the participants.

The second of the classes includes societies providing sickness benefits. The speaker thought that it was unnecessary to require of these societies a method of working entirely scientific, because generally they do not possess either men competent to apply the method, or sufficient resources to remunerate experts. It would, therefore, be useless to demand of them that which they cannot supply, or to assimilate them strictly to assurance companies. If their rates of contribution are properly calculated once for all, and if they set aside approximately correct reserves, they may be looked upon as managed in a satisfactory way. It is not even necessary to graduate the rates of contribution according to every year of age of entry, which would appear to be too complicated in many cases. It is sufficient to graduate the contributions by quinquennial or even decennial periods of age: for instance, for the ages at entry, 15 to 30, 30 to 40, 40 to 45, &c. Should a deficiency arise notwithstanding these somewhat perfunctory precautions, it is, moreover, in most cases liquidated by special income received from honorary members, or in some similar way,

Lastly, the third class of societies includes those which undertake operations of long date, such as the grant of pensions or of death payments. For such societies, the control of actuarial science is absolutely indispensable, for

L'intervention de l'actuaire doit être considérée comme indispensable, mais elle doit aussi se maintenir dans de sages limites.

On peut d'ailleurs classer les sociétés des ecours mutuels en trois catégories, qui réclament des traitements divers.

Dans la première de ces catégories, il faut ranger les sociétés dont le but est d'indemniser les victimes des accidents et du chômage, abstraction faite de l'octroi d'une pension à ces victimes. Ici, chaque année forme un cycle financier complet, dont les recettes et les dépenses s'équilibrent. Il est impossible que la société vive si elle ne reçoit pas des sommes suffisantes pour faire face à ses dépenses. Le contrôle scientifique est donc presque superflu dans ce cas, et ne peut être réclamé que pour parfaire la répartition des charges entre les participants.

La deuxième catégorie comprend les sociétés qui donnent des secours en cas de maladie. L'orateur pense que l'on ne saurait exiger de ces sociétés un fonctionnement tout à fait mathématique, car elles ne possèdent, en général, ni hommes capables de régler ce fonctionnement, ni ressources suffisantes pour rétribuer des spécialistes. Il serait donc inutile de leur demander ce qu'elles ne peuvent donner, et de les assimiler strictement à des compagnies d'assurances. Si leurs cotisations sont bien établies, une fois pour toutes, et si elles constituent des réserves approximatives, elles peuvent être considérées comme gérées d'une façon satisfaisante. On ne doit même pas essayer de faire varier les cotisations par années d'âge à l'entrée, ce qui paraîtrait trop compliqué dans bien des cas; il suffit de graduer ces cotisations par périodes quinquennales ou même décennales, par exemple pour des âges à l'entrée de 15 à 30 ans, de 30 à 40, de 40 à 45, &c. Lorsqu' un déficit se produit malgré ces précautions un peu sommaires, il est d'ailleurs le plus souvent comblé par des recettes exceptionnelles, provenant des membres honoraires ou de toute autre source du même genre.

Enfin, la troisième catégorie renferme les sociétés qui entreprennent des opérations à long terme, telles que la consti-

any technical error in the constitution or management may produce a real disaster. The contributions must first be very accurately calculated for each year of age at entry, and not for longer periods, because the changes are rapid. Were the contributions too small, the pensions could not be paid under the conditions agreed upon. Were they too high, the inconvenience would be less; but, nevertheless, the members would have been subjected to needless sacrifices, which would doubtless have exceeded the resources of some of them. Here, also, the calculation of the reserves must be very exact, and no longer only approximate, in order that the payment of the promised sums may be rendered quite certain. In one word, the management of such societies must be in every respect similar to that of assurance companies.

To summarize his views, the speaker finished by saying that the intervention of the actuary in the affairs of friendly societies, must be graduated according to the nature of the operations undertaken by the societies, and wisely limited to the strictly necessary, so as not to hinder, by exaggerated requirements, the natural development of these useful institutions.

tution des retraites et l'assurance au décès. Pour ces sociétés, le contrôle de la science actuarielle est absolument indispensable, car toute erreur technique dans l'organisation ou la gestion peut produire un véritable désastre. Il faut d'abord que les cotisations soient trés exactement établies, par années d'âges à l'entrée, et non plus par périodes, car les variations sont rapides. Si ces cotisations étaient trop faibles, les pensions ne pourraient être payées dans les conditions convenues. Si elles étaient trop élevées, l'inconvénient serait moindre; mais, cependant, on aurait obligé les participants à des sacrifices inutiles qui auraient sans doute excédé les ressources de quelques-uns. Ici, le calcul des réserves doit être aussi très correct et non plus approximatif, pour rendre absolument certain le payement des sommes promises. En un mot, la gestion de ces sociétés doit être tout à fait semblable à celle des compagnies d'assurances.

Pour résumer sa pensée, l'orateur conclut donc en disant que l'intervention de l'actuaire dans les sociétés de secours mutuels doit être graduée suivant la nature des opérations entreprises par ces sociétés, et prudemment limitée au strict nécessaire, pour ne pas entraver par des exigences exagérées le développement naturel de ces institutions si utiles.

Mr. Reuben Watson (Nottingham) said that what he had to bring forward had been very much discounted by the excellent, accurate, and descriptive remarks of Mr. Neison, with which he thoroughly agreed. He had set himself, 48 years ago, to work for the improvement of friendly societies, and had not ceased to work in that direction. Although friendly societies were established on social principles rather than on the scientific principles that he would have preferred, he was not sure that the social idea had not been the best for them. Their members regarded the fraternal bond more than the financial bond, and always respected it more. The Manchester Unity of Oddfellows had been honoured by Mr. Neison's recognition of what they had done in the way of reform. There had been great advancement in friendly societies, but he did not think it fair to draw a comparison between the high position of the well-instructed intellectual insurance societies and the humble working man's society. So much could not be expected of the latter as of the former. He thought the President's allusion to the want of knowledge on the part of the members of friendly societies was the reason why they had not advanced more rapidly. He thought the scientific advancement of friendly societies was going on almost as rapidly as could be expected. He had read through with interest the paper of Mr. Brabrook, and of course accepted it as the basis, as the foundation, of friendly societies in this country. The friendly societies were indebted to the Acts of Parliament,

which had brought about improved regulations. He had also listened with pleasure to the paper by Mr. Newman, but he could not agree with all that that writer had said. For instance, he believed that all friendly societies should be registered, but he thought that an actuarial certificate of their solvency might be an evil greater than that for which it is proposed as a remedy. Immediately after the certificate was given there would be just as much carelessness as before.

The PRESIDENT, in closing the proceedings, desired to place on record the extreme appreciation of the Congress of the papers which had been submitted, and of the services of the gentlemen who had kindly acted as interpreters. He announced that some of their friends from Holland had taken considerable trouble in searching among the State archives with reference to insurce matters, and especially the works of De Witt. Extracts from these archives had been translated into French for their friends and printed in a volume, and each member was asked to accept a handsomely bound copy.

The Congress then adjourned.

De la Notation Universelle.

PAR AM. BÉGAULT,
Actuaire de la Compagnie Belge d'Assurances Générales sur la Vie.

Il y a trois ans, le premier Congrès International d'Actuaires, dans sa séance du 3 septembre 1895, votait à l'unanimité la proposition de Monsieur Léon Marie, délégué de l'Institut des Actuaires Français, ainsi conçue :

1° La notation de l'Institute of Actuaries sera employée de préférence par les actuaires des différents pays.

2° Les modifications que l'on reconnaîtra nécessaire d'y apporter seront examinées dans les prochains Congrès Internationaux.

Nous ne reviendrons pas sur les motifs qui, en 1895, ont fait reconnaître, par l'unanimité des actuaires présents, les avantages que présenterait une notation universelle. Les questions proposées par le Comité organisateur du Congrès actuel, montrent suffisamment l'extension de jour en jour plus grande du domaine de la science actuarielle ; nous devons donc insister aujourd'hui, plus encore que nous ne le faisions précédemment, pour que l'on adopte, en ce qui concerne l'assurance sur la vie, une notation reconnue par tous comme la meilleure. De cette manière, nous pourrons voir s'établir dans ces nouvelles applications de la science une notation simple, basée sur les mêmes principes, et ne prêtant pas à la confusion que ne manquerait pas d'amener la création d'une notation complètement indépendante.

De tous les pays représentés au dernier Congrès, la France seule, à ma connaissance, a repris l'étude de la question. Le rapport présenté à l'Institut des Actuaires français, dans la séance du 18 juin 1896, est dû à Monsieur Léon Marie, Secrétaire-Général de cette Société savante. La notoriété qui s'attache au nom de l'auteur, la part importante prise par lui à la discussion en 1895, le désir que nous avons de mettre sous les yeux de tous les membres de ce congrès les critiques et les éloges de notre Collègue, nous engagent à reproduire son travail in extenso. Nous le ferons suivre des observations présentées par Messieurs Laurent et Poterin du Motel à la suite de cette communication.

La voici, telle qu'elle figure au Bulletin de l'Institut des Actuaires français (no. 25, page 120 et suivantes):

" Sans être absolument parfaite (rien n'est parfait en ce monde), la notation " de l' Institute of Actuaries est certainement la plus complète et la plus ingénieuse " de toutes celles qui ont été employées jusqu'ici. Mais son ingéniosité même " rend les modifications très délicates, et il ne faut pas toucher sans précautions à " ce mécanisme un peu compliqué.

" Je pense que nous devons tout d'abord mettre de côté tout puéril amour-" propre national et adopter franchement les initiales des mots anglais, consacrées " par l'usage. Elles sont d'ailleurs en grande majorité, semblables à celles des mots " français correspondants. Vouloir substituer la notation v_x, par exemple, à la " notation l_x serait un pur enfantillage, sans la moindre utilité, car il est évident " que nos confrères étrangers refuseraient de nous suivre dans cette voie.

" Mais, puisqu'il s'agit d'une notation *universelle*, je crois qu'on pourrait se " borner à représenter d'une manière uniforme les éléments en usage dans tous les " pays et qu'il conviendrait de mettre à l'écart tout ce qui concerne des opérations " essentiellement britanniques, telles que les Baux viagers, Advowsons, &c. On " élaguerait ainsi un peu cette notation à laquelle on a pu, non sans quelque raison, " reprocher d'être trop 'touffue.' Le prochain Congrès devrait donc, à mon avis, " dresser la liste précise des règles et des signes rendus universels, à l'exception " de ceux dont l'utilité ne paraîtrait pas suffisamment démontrée pour justifier leur " admission.

" En outre, après avoir hautement reconnu les très grandes qualités et la " valeur incontestable de la notation imaginée par l'Institute of Actuaries, je crois " pouvoir me permettre de la critiquer, en certains points de détails, et je pense " qu'elle devrait recevoir quelques légères améliorations avant d'obtenir définitive-" ment le caractère universel qui lui a été provisoirement attribué l'an dernier. " Je me propose d'exposer ici mes critiques et les modifications qui me paraissent " désirables, afin de recueillir l'avis de tous les membres de notre association et de " mettre leurs observations à profit.

" 1° Il me semble d'abord inutile et gênant d'employer plusieurs notations " pour désigner un seul et même élément. Pourquoi ne pas adopter celle des nota-" tions en usage qui est la plus rationnelle ? Ainsi, toute assurance de capital est " représentée par la notation A. L'assurance d'un capital différé est donc très " logiquement figurée par $A^{\frac{1}{}}_{x\overline{n}|}$. Pourquoi la désigner aussi par ${}_nE_x$? De même, " on représente la valeur d'une annuité temporaire, tantôt par $|_n a_x$, tantôt par " $a_{x\overline{n}|}$. Ne vaut-il pas mieux choisir entre ces deux notations et adopter définitive-" ment $a_{x\overline{n}|}$?

" 2° Cette première critique m'amène naturellement à envisager les indices " placés à la gauche de la lettre principale, comme dans $|_n a_x$. Leur emploi me " paraît absolument condamnable, car si dans le texte imprimé les confusions sont " impossibles, il n'en est pas de même dans un texte manuscrit. Les indices " placés à gauche d'une lettre se mélangent alors aisément avec ceux qui prennent " place à la droite de la lettre précédente. D'ailleurs, l'emploi de ces indices est " complètement inutile. L'annuité temporaire se représente aussi bien par $a_{x\overline{n}|}$ que " par $|_n a_x$, l'annuité différée par $a_{\overline{n}||x}$, que par ${}_n|a_x$; l'assurance en cas de décès " temporaire par $A^{1}_{x\overline{n}|}$, que par $|_n A_x$ et ainsi de suite. L'assurance à terme fixe, " que l'Institute of Actuaries a laissée de côté, peut être aussi figurée par $A_{\overline{n}|}$.

" Quant aux indices placés à gauche et en haut, comme ${}^n l_{xyz}$ pour " $l_{x+n;\,y+n;\,z+n}$, ils sont d'un usage si peu fréquent, qu'ils disparaîtraient sans aucun " inconvénient.

" 3° Les éléments qui dépendent d'une assurance ou d'une annuité, sont " représentés, à leur tour, de différentes manières. Ainsi la prime annuelle viagère " d'une assurance en cas de décès pour la vie entière, s'écrit P_x ou PA_x. De même, " la réserve sera V_x ou VA_x. La valeur réduite d'une police est (FP). Quant au " prix de rachat, il n'a pas de symbole particulier. Pourquoi ne pas adopter un " symbole uniforme pour chacun de ces éléments, P pour la prime, V pour la " réserve, F pour la valeur réduite, G pour le prix de rachat, et joindre ce symbole " à celui qui exprime la nature de l'opération d'assurance ? On écrirait ainsi en " affectant le premier symbole des indices qui lui sont propres :

" PA_x pour une prime viagère.

" $P^{(m)}\ A_{\overline{n}|}$ pour une prime temporaire payable par fraction chaque année.

" V_nA_x, F_nA_x, G_nA_x, pour la réserve, la valeur acquise ou le prix de rachat après n années.

" On supprimerait ainsi le symbole U, qui n'entre pas logiquement dans le " système.

" Quant à la prime unique, au lieu de la désigner par P_1A_x, on pourrait, pour " simplifier, lui laisser le symbole A_x tout court.

" 4° Un autre moyen d'unifier la représentation des primes, dont l'usage est " si fréquent, serait de mettre en exposant le nombre des primes à payer. Ainsi, " la prime unique serait A^1_x. ou A_x tout court. La prime temporaire d'une durée " de n années serait A^n_x. Enfin, la prime viagère se trouverait figurée par A^∞_x, ou " par tout autre symbole simple, tel que A^o_x.

" Ce second moyen serait plus mathématique que le premier, car il y a une " continuité réelle entre la prime unique, les primes payables pendant 2, 3, 4 . . . " ans et enfin la prime viagère, qui seraient alors respectivement figurées par :

$$A^1_x \; A^2_x \; A^3_x \; . \; . \; . \; . \; A^n_x \; . \; . \; . \; . \; A^\infty_x \quad \text{ou} \quad A^o_x.$$

" Mais, dans l'écriture courante, ces petits chiffres pourraient se confondre soit " avec ceux qui sont placés au-dessus des indices inférieurs, notamment dans les " assurances de survie, telles que A^1_{xy} ou A^2_{xy}, par exemple, soit avec les accents, " comme dans A'_x ou a'_x.

" 5° Dans les publications de l'Institute of Actuaries, on désigne souvent par " P', A' et a' des primes chargées. Je crois qu'il faudrait généraliser cet usage et " désigner toujours par P' P'', A' A'', a' et a'' les primes commerciales et les " primes d'inventaire.

" 6°. J'arrive aux symboles des tables de commutation. Ici, une seule critique " peut être faite, mais je la crois irréfutable. Pourquoi désigner par N_x la somme " $D_{x+1} + D_{x+2}$ + etc., tandis que tous les autres symboles désignent des sommes " commençant à l'âge x lui-même ? C'est là une source d'ennuis et de confusions " des plus regrettables. Les Américains et les Français ont adopté pour N_x la " somme $D_x + D_{x+1}$ etc., suivant le système de Barrett et de Tetens, de telle sorte " que la méthode de G. Davies n'est employée qu'en Angleterre. Cette méthode " est condamnée par l'Institute of Actuaries lui-même, dans son 'Text Book' " (page 109 de la traduction française) [1] et n'a été conservée que par routine ! " Le moment me paraît venu d'y renoncer et d'uniformiser le système des symboles " adoptés pour la commutation.

" 7°. Enfin j'arrive à la double notation r et v, l'une désignant $(1 + i)$, l'autre $\frac{1}{1+i}$. " Cette double notation est tout-à-fait inutile. Qu'on désigne $1 + i$ par r, afin " d'abréger les formules, c'est là une excellente simplification, d'autant plus que i " est rarement employé indépendamment de l'unité. Mais quel besoin d'appeler v, " ce qui se représente tout naturellement par r^{-1} ? Quel est le mathématicien, " même novice, qui ne comprendra pas ce que signifie l'exposant négatif ? Je " crois donc utile de réduire le nombre des symboles en supprimant v. De même " pour d, qui figure $1\text{-}v$. C'est là un symbole bien peu nécessaire, et d'ailleurs, d " représente d'autre part le nombre des décès. Il est évidemment fâcheux de donner " deux significations aussi différentes à la même lettre.

" 8°. Il me resterait encore quelques observations à formuler au sujet des " opérations à capital ou à rente variable, ainsi qu'au sujet des opérations relatives à " la morbidité. Mais je ne veux pas trop abuser de la patience de mes collègues, et, " pour le moment, je bornerai là mes critiques.

" Peut-être trouvera-t-on bien hardie la prétention que j'émets de vouloir " réformer, sur quelques points, l'œuvre longuement élaborée par les plus éminents " de nos confrères d'Outre-Manche. Je m'excuserai en déclarant une fois de plus " que je considère cette œuvre comme un monument très remarquable de la science " actuarielle, et je crois précisément lui rendre hommage en signalant les quelques " imperfections qui déparent, selon moi, l'harmonie de l'édifice.

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[1] " Puisque dans les applications pratiques, de la science des opérations viagères, on rencontre bien plus souvent des primes que des annuités, le changement de Davies dans la façon de sommer les colonnes a pour effet de détruire la symétrie de la plupart des formules, et présente donc un avantage douteux, mais comme il a été universellement adopté, nous l'accepterons aussi. . . ."

" M. Laurent estime qu'une notation uniforme est encombrante et surcharge " inutilement la mémoire, quand il est si facile d'expliquer en quelques lignes, au " début d'une note ou d'un ouvrage, le sens des notations dont on doit faire usage.

" M. Léon Marie répond qu'il ne saurait être question d'adopter une notation " universelle compliquée, mais seulement des symboles immuables pour représenter " les éléments les plus fréquemment employés. La notation entièrement libre " présente cet inconvénient, auquel lui-même s'est heurté, que, lorsqu'on lit un " ouvrage écrit dans une langue étrangère, on peut être fort embarrassé même pour " comprendre les explications de l'auteur sur le sens des symboles employés. Au " contraire, lorsque le sens est connu à l'avance, on arrive souvent à dégager la " pensée de l'auteur de la seule succession des formules qui accompagnent le " texte.

" M. Poterin du Motel présente quelques observations sur certains signes de la " notation anglaise, relatifs à l'ordre de survivance. Cet ordre est désigné tantôt " par des barres verticales, tantôt par de petits chiffres placés en-dessus ou en- " dessous des symboles principaux. Ces deux modes ne font pas toujours double " emploi, et telle quantité ne peut être désignée qu'en faisant appel à tous deux " simultanément, comme dans la notation $a^{1}_{xy|z}$. Cela provient de ce que chacun " de ces signes indique à la fois deux choses différentes. Par exemple, dans les " notations $A_{x|y}$ et A^{2}_{xy}, qui sont équivalentes, la barre verticale, aussi bien que " l'indice 2, indique non seulement que l'ordre des décès doit être x, y, mais aussi " que le capital doit être payé au décès de y. Il en resulte une sorte de confusion " dans les attributions des symboles, et il serait certainement plus clair d'employer " deux signes différents, mais ayant chacun un sens unique : l'un pour désigner " *exclusivement* l'ordre des décès, l'autre pour distinguer seulement la tête au " décès de laquelle le capital doit être payé."

Pour plus de facilité, reprenons les remarques faites par Monsieur Léon Marie dans l'ordre où lui-même les a présentées :

1° Inconvénient d'une double notation pour la même opération : $A^{\frac{1}{}}_{x\overline{n}|}$ et ${}_{n}E_{x}$, $a_{x\overline{n}|}$ et ${}_{n|}a_{x}$.

Nous ferons remarquer que les symboles $A^{\frac{1}{}}_{x\overline{n}|}$ et $a_{x\overline{n}|}$ n'ont pas été inventés ; ils sont la conséquence d'une remarque (Text-Book, Chap. VII. § 50), permettant de remplacer dans une formule une tête par un nombre certain d'années. Si ${}_{n}E_{x}$ (notation dans laquelle n a la même signification que dans ${}_{n}p_{x}$) a subsisté, c'est sans doute parce que le capital différé est la première notion de science actuarielle. N'oublions pas que la notation de l'Institute of Actuaries sert principalement dans l'enseignement, et que le professeur qui débuterait par inscrire le symbole $A^{\frac{1}{}}_{x\overline{n}|}$ avant d'avoir parlé d'assurance, risquerait de n'être pas compris de son auditoire. Il en est de même de $a_{x\overline{n}|}$ pour l'élève ne connaissant pas encore l'annuité sur deux têtes.

Certes, si deux signes quelconques, un A et un A par exemple, représentaient la même opération, il y aurait surcharge inutile pour la mémoire et le maintien des deux symboles ne se défendrait pas. Mais ce n'est pas le cas ici ; la notation anglaise est essentiellement figurative, et ni $a_{x\overline{n}|}$ ni ${}_{n|}a_{x}$ ne demandent le moindre effort de mémoire à celui qui connaît l'esprit de la notation. Ainsi, ${}_{n|}a_{x}$ exprime que zéro année s'écoulera (l'opération est donc immédiate) puis que la combinaison représentée par ${}_{n|}a_{x}$ durera n années ; $a_{x\overline{n}|}$ exprime que le payement de l'annuité dépend de l'existence commune d'une tête (x) et de $\overline{n}|$, nombre d'années. Dans ces conditions, il ne me semble pas que l'on puisse reprocher cette richesse de symboles à la notation anglaise plus que les synonymes à une langue littéraire.

Rappelons-nous aussi que ${}_{n|}a_{x}$ permet d'écrire et de lire facilement ${}_{m|n}a_{x}$ (annuité temporaire et différée).

Toutefois, la raison didactique me paraît la plus sérieuse, pour le

maintien de ${}_{n}\mathrm{E}_{x}$ et ${}_{n}|a_{x}$; car on conseille d'employer de préférence les symboles dérivés du remplacement d'une tête par un nombre d'années (Text-Book, Chap. VII. § 50).

2° Suppression des indices placés à gauche des symboles.

S'il était possible de supprimer tout symbole à gauche, je serais de l'avis de Monsieur Marie ; mais je ne crois pas qu'on puisse y arriver. En effet, si p_x^n (notation française) représente aussi clairement que ${}_{n}p_{x}$ (notation anglaise) la probabilité qu'a (x) d'être vivant dans n années, je ne vois pas, sans l'emploi d'indice à gauche, ou sans risque de confusion, le moyen de représenter des probabilités un peu plus compliquées, telles que ${}_{n}p_{\overline{xy}}^{\,1}$ (probabilité que le survivant de (x) et de (y) a de vivre encore n années) ou ${}_{n}p_{xy}^{\,[1]}$ (probabilité que sur les deux têtes (x) et (y) une seule sera vivante dans n années). A ces probabilités correspondent des annuités, s'écrivant d'après la même loi, dont l'une $a_{\overline{xy}}^{\,[1]}$ est l'assurance de rente de survie réciproque, pratiquée par les Compagnies d'assurances.

Et même si l'on considère la simple annuité, on doit pouvoir indiquer :

1° L'âge de la tête sur laquelle elle repose.

2° La limitation des payements (différée, temporaire).

3° La fréquence des payements annuels.

Dès lors, nous sommes forcés de mettre à gauche une de ces indications.

Quant à l'adoption de $\mathrm{A}_{\overline{n}|}$ pour l'assurance à terme fixe, dont la valeur est v^n, elle est très rationnelle.

En ce qui regarde la suppression de l'abréviation ${}^{n}l_{xyz}$, son emploi est surtout théorique dans les opérations reposant sur un grand nombre de têtes. L'enseignement élémentaire se bornant le plus souvent à deux têtes, on pourrait parfaitement s'en passer.

3° Suppression du symbole A dans l'expression de la prime annuelle, de la valeur réduite, . . . etc.

Je suis entièrement d'accord avec Monsieur Marie. La faculté laissée aux auteurs de représenter la prime annuelle par la lettre P seule, ou accolée à la prime unique, comme $\mathrm{P}a_{y|x}$ (Text-Book, édition française, p. xlix.), devrait être changée en règle et l'on devrait toujours réunir les deux symboles,

1° parce qu'il y a des opérations qui exigent cette réunion ; telles sont les assurances de rente de survie, les rentes viagères différées, . . . etc. dont les primes annuelles doivent s'écrire $\mathrm{P}a_{y|x}$, $\mathrm{P}_{n|}a_{x}$ ou $\mathrm{P}a_{\overline{n}|x}$.

2° parce qu'il peut se faire que le nombre de primes stipulé soit inférieur à celui du nombre d'années d'assurance ; telles sont toutes les opérations à prime annuelle uniforme et à capital décroissant, telles sont les assurances mixtes pour n années dont la prime ne se paie que pendant n' années.

Il serait donc logique d'affecter le symbole P de tout ce qui a rapport au mode de payement de la prime, le symbole voisin étant toujours celui de la prime unique.

${}_{n'}\mathrm{P}^{(2)}\mathrm{A}_{x\overline{n}|}$ représentera donc la prime annuelle payable par semestre pendant n' années d'une assurance mixte pour n années sur la tête de (x).

Bien que l'indication qui se trouve à la droite de P ne puisse jamais être attribuée erronément à A, on pourrait décider de toujours séparer les deux symboles par un point, comme ceci ${}_{n'}\mathrm{P}^{(2)}.\mathrm{A}_{x\overline{n}|}$; mais ce serait

inutile, et pourrait faire supposer la multiplication de ${}_{n'}P^{(2)}$ par $A_{\overline{xn}|}$, erreur peu à craindre cependant, ${}_{n'}P^{(2)}$ n'ayant aucune valeur par lui-même. Ce que nous venons de dire de P, s'applique à V, valeur de la police ou réserve mathématique, (FP) montant de la police libérée qu'avec Monsieur Marie je voudrais voir désigner par F, et aussi à G, valeur de rachat.

N'ayant pas supprimé, comme nous l'avons dit plus haut, l'indice à gauche, nous écrirons donc :

$${}_nVA_x \text{ ou } {}_nV.A_x,\ {}_nFA_x \text{ ou } {}_nF.A_x,\ {}_nGA_x \text{ ou } {}_nG.A_x$$

pour la réserve mathématique, la valeur de réduction et la valeur de rachat après n années d'une assurance pour la vie entière sur la tête de (x).

4° Emploi constant de A.

Ce mode de représentation, comme le dit l'auteur lui-même, est malheureusement impossible. Car on risquerait de confondre A^2_{xy}, prime unique d'une assurance payable au décès de (x) s'il survit à (y), avec A^2_{xy} qui, dans le nouveau système, serait la prime annuelle payable pendant deux années pour une assurance au premier décès dans le groupe (xy).

Nous ne nous y arrêterons donc pas.

5° Ici encore, je suis d'accord avec Monsieur Léon Marie et dans mon rapport au Congrès de 1895 (Rapport n° 1, page 12,–Documents du 1er Congrès d'Actuaires), j'avais préconisé l'adoption de l'écriture :

P,A, a, pour les primes pures

P′,A′, a', pour les primes d'inventaire

P″,A″, a'', pour les primes commerciales.

A ce propos, remarquant que la valeur de rachat est en réalité la valeur commerciale de la réserve mathématique, on pourrait par analogie, la représenter par V″. L'introduction du symbole G, préconisée au 3°, deviendrait donc inutile.

6° Adoption de N_x du système de Barrett et de Tetens.

Faut-il adopter pour N_x la somme des valeurs de D à partir de D_x ou de D_{x+1} ?

Chacune des représentations a eu et a encore ses partisans et ses adversaires, chacune a ses avantages et ses inconvénients : l'une dérange la symétrie des formules d'annuités, l'autre celle des formules d'assurance en cas de décès. Il serait oiseux de reprendre à ce sujet tout ce qui a été dit autrefois. (V. Journal de l'Institute of Actuaries, vol. x., p. 301 et vol. xiv., p. 200) et lors du dernier Congrès (V. Rapport de Mr. Israel C. Pierson, Documents du 1er Congrès international d'Actuaires ; I. p. 17 à 22).

La seule solution est celle qu'a donnée l'Institute of Actuaries ; c'est l'adoption officielle des deux signes ;

$$N_x = D_{x+1} + D_{x+2} + \quad . \quad . \quad .$$

$$\mathbb{N}_x = D_x + D_{x+1} + D_{x+2} + \quad . \quad . \quad .$$

Les actuaires américains préfèrent la lettre antique **N** plus facile à imprimer ; les actuaires anglais (Jnl. Inst. Act. Oct. 1896, Vol. XXXIII p. 37) la lettre en blanc $\mathbb{N}$ à cause de la difficulté de distinguer dans un manuscrit une lettre romaine N d'une lettre antique **N**. D'ailleurs,

au point de vue pratique, cela a très peu d'importance, un coup d'œil à la valeur de N_x correspondant à l'âge extrême de la table, indiquant de suite au lecteur le système d'après lequel celle-ci a été dressée.

7° Suppression des notations v,d.

La suppression de $v = \frac{1}{1+i}$, est demandée sous prétexte qu'il existe une notation $r = (1+i)$. Si telle est la seule raison, comme r n'est jamais employé, tandis que v se rencontre à tout moment, je renverse la proposition et demande qu'on maintienne v, quitte à employer r pour $(1+i)$.

En effet, tous les calculs d'annuités ou d'assurances ont pour but la détermination de la valeur actuelle de l'opération; c'est-à-dire de la prime unique. Cette quantité étant toujours la somme des espérances mathématiques des divers payements qui la composent, il est tout rationnel d'adopter une notation spéciale pour la valeur escomptée de 1. De plus, v est pratiquement très utile, car, mis à la place de $(1+i)^{-1}$ il remplace sept signes typographiques par un seul. J'ajouterai même que v est une notation tellement naturelle, que notre regretté collègue, M. Mahillon, dans les calculs qu'il fit en 1886, pour établir les nouveaux tarifs de la Caisse de Retraite de Belgique, avait imaginé a pour éviter dans ses calculs $(1+i)^{-1}$ et ses puissances qui revenaient à chaque ligne. Quant à d pris pour $(1-v)$, sa raison d'être provient surtout de la nécessité où l'on s'est trouvé de représenter dans le cas le plus simple la valeur de l'escompte pour arriver finalement à δ, taux instantané, base de la méthode continue pour le calcul des annuités et des assurances en cas de décès. De plus l'introduction de d dans les formules de A_x et de P_x (Text-Book, Chap. VII. §§ 43, 58, 59, 60, 61, 62 et 64), donne de ces valeurs des interprétations si élégantes et si instructives pour l'élève, qu'on serait tenté de l'excuser. Enfin, l'introduction de d dans ces formules, facilite grandement l'exposé des Tables de Conversion, et de la théorie des Usufruits et nues-propriétés. (Text-Book, chap. VIII et XIX.) On ne pourra confondre d, escompte, avec d nombre de décès, le premier ne pouvant avoir pour indice qu'un taux d'intérêt entre parenthèses; comme $d_{(i)}$.

L'observation de M. Poterin du Motel est parfaitement juste; il voudra cependant remarquer que, dans le Text-Book, ni au Chap. XIII (Assurances de Survie), ni au Chap. XV (Assurances de survie composée) on n'a employé la barre verticale pour séparer les status. Toujours on a pris les chiffres placés soit au-dessus, soit au-dessous des têtes considérées. Seules les annuités de survie composée, donnent lieu à des notations telles que $a^1_{xy\,|\,z}$; mais y a-t-il moyen de l'éviter? Je ne le pense pas, l'indice contenant des têtes dont on envisage la probabilité de vie, en même temps que la probabilité de décès des autres dans un ordre déterminé. Mais il faut remarquer que cette expression se lit aussi couramment que si elle était écrite en toutes lettres. En effet, c'est une annuité dont jouira (z) à partir du décès de (x) si celui-ci meurt avant (y). Il suffit de se rappeler que le chiffre placé au-dessus d'une lettre de l'indice, indique la tête dont la disparition amène l'entrée en jouissance immédiate de la rente ou le payement du capital assuré.

Conclusions.

Sans nous préoccuper, comme le dit Monsieur Marie, des opérations essentiellement britanniques, si nous écartons du rapport de notre Collègue français le 4° dont il reconnaît lui-même l'impossibilité d'application, et le 6° dont la sanction officielle existe déjà, il ne reste plus que cinq paragraphes, repris sous les nos. 1, 2, 3, 5, et 7 de son travail. En ce qui concerne le 1° et le 2°; nous croyons avoir montré que tout en trouvant parfaitement fondées les remarques qu'ils contiennent, il n'est pas possible de lui donner complète satisfaction.

Pour le 3° et le 5°, nous sommes complètement d'accord avec lui.

Quant au 7°, nous demandons qu'il veuille bien se rallier aux bonnes raisons que nous avons indiquées pour l'adoption de v et de d.

Il ne nous reste donc plus qu'à demander à l'Institute of Actuaries de bien vouloir examiner les légères modifications que nous avons proposées; nous pourrons espérer alors voir, comme en 1895, un vote unanime du Congrès adopter la notation universelle.

Translation.

On a Universal Notation. By A. Bégault, *Actuary of La Compagnie Belge d'Assurances Générales Sur la Vie.*

Three years ago the first International Congress of Actuaries, at its meeting on 3 September 1895, unanimously passed the following resolutions, proposed by M. Léon Marie, delegate of the Institute of French Actuaries:

> " (1) The notation of the Institute of Actuaries shall be " employed in preference by the actuaries of all " countries.
> " (2) Such modifications thereof as may be found necessary " shall be considered at future International Con- " gresses."

We shall not revert to the motives which, in 1895, led to the unanimous recognition by the actuaries present of the advantages which would be secured by a uniform notation. The questions proposed by the Organizing Committee of the present Congress, sufficiently show the daily extending domain of actuarial science, and we must, therefore, insist to-day more than ever we have done before on the adoption, so far as life assurance is concerned, of the notation recognized by all as best. In this way we shall see established under these new applications of the science a simple notation based on a uniform principle, and not involving the confusion which could not be avoided by the compilation of a completely independent notation.

Of all the countries represented at the last Congress, France only, so far as I know, has studied the question afresh. A report was presented to the Institute of French Actuaries, at the meeting of 18 June 1896, from the pen of M. Léon Marie, general secretary of that learned society. The well-known name of the author and the important part he took in the discussion in 1895, coupled with the desire which we feel to place before all the members of the present Congress the criticisms and the praises of our colleague, lead me to reproduce his work *in extenso*.

Following it, are given the observations made by Messrs. Laurent and Poterin du Motel, on the occasion of that communication.

Here it is as it appears in the *Journal of the Institute of French Actuaries* (No. 25, pages 120 *et seq.*):

" Without being absolutely perfect (nothing is perfect in this " world) the notation of the Institute of Actuaries is certainly the most " complete and ingenious of all those which have been hitherto

" employed. But its very ingenuity renders changes in it very " delicate, and such complicated mechanism must not be touched " without caution.

" I think that we must, at the outset, put on one side all puerile " national *amour propre* and frankly adopt the initials of English " words, consecrated by use. They are, moreover, in the majority " of cases, the same as those of the corresponding French words. " To substitute, for instance, the notation v_x for l_x would be childish " in the extreme, without serving the least use, for it is evident that " our foreign brethren would refuse to follow us. But as it is a " *universal* notation which is in question, I think that we should limit " ourselves to represent in a uniform manner the functions in use in " all countries, and that it would be well to leave out all those which " concern transactions essentially British, such as leases for lives, " advowsons, &c. We should thus prune a little that notation against " which it can be alleged with some reason that it is redundant. The " next Congress, therefore, should, in my opinion, settle the precise " list of the rules and the signs to be employed universally, excepting " those of which the use would not be sufficiently evident to justify " their admission.

" Moreover, having thus frankly recognized the great qualities " and incontestable value of the notation adopted by the Institute of " Actuaries, I feel that I am entitled to criticise certain points of detail; " and I think that it might be subjected to certain minor improvements " before being finally given the universal character which was granted " it provisionally last year. I propose, here, to set out my criticism, " and the modifications which seem to me desirable, so as to ascertain " the opinion of all the members of our Association, and to obtain the " benefit of their remarks.

" (1.) It seems to me to be useless and inconvenient to employ " several symbols to denote one and the same function. Why not " adopt that one of the symbols in use which seems the most rational? " Thus, all assurances of capital sums are represented by the symbol A. " The endowment is, therefore, very logically represented by $A_{x\overline{n}|}^{1}$. " Why, therefore, denote it also by ${}_nE_x$? Similarly, why represent " the value of a temporary annuity, sometimes by ${}_{|n}a_x$ and sometimes " by $a_{x\overline{n}|}$? Would it not be better to select one of these two symbols, " and to finally adopt $a_{x\overline{n}|}$.

" (2.) This first criticism leads me naturally to examine the indices " placed on the left of the principal letter, as in ${}_{|n}a_x$. Their employ- " ment it seems to me should be absolutely condemned, because even if " in print confusion is impossible, it is not so in manuscript. Indices " placed on the left of a letter then easily get mixed with those on the " right of a preceding letter. Moreover, the employment of these " indices is quite useless. The temporary annuity could be equally " well represented by $a_{x\overline{n}|}$ as by ${}_{|n}a_x$; and the deferred annuity by $a_{\overline{n}|x}$ as " by ${}_{n|}a_x$. The temporary assurance by $A_{x\overline{n}|}^{1}$ as by ${}_{|n}A_x$ and so on. " The assurance for a fixed term, which the Institute of Actuaries does " not mention, could also be represented by $A_{\overline{n}|}$.

" As to the indices placed above and to the left, as ${}^{n}l_{xyz}$ for " $l_{x+n:y+n:z+n}$, they are so seldom used that their disappearance could " cause no inconvenience.

" (3.) The functions which are derived from an assurance or from " an annuity are in their turn represented in different ways. Thus the " annual premium payable throughout life for a whole life assurance can " be written P_x or PA_x. Similarly the policy value is V_x or VA_x. " The amount of a paid-up policy is (FP). As to surrender-values, " these have no special symbol. Why not adopt a uniform symbol for " each of these functions; P for the premium, V for the policy-value, " F for the paid-up policy; G for the surrender-value; and attach " this symbol to that which represents the nature of the benefit? " We should thus, in qualifying the first symbol by suitable indices, " have PA_x for a whole life premium, $P_n^{(m)} A_x$ for a premium by " limited payments payable fractionally throughout the year.

" $V_n A_x$, $F_n A_x$, $G_n A_x$, for the policy value, the paid-up policy, " and the surrender value after n years.

" We should thus suppress the symbol U, which does not enter " logically into the system.

" As to the single premium, instead of designating it by $P_1 A_x$, " we could for simplicity employ the symbol A_x alone.

" (4.) Another method to harmonize the representation of " premiums in such frequent use would be to place as an exponent " the number of premiums to be paid. Thus, the single premium " would be A_x^1, or briefly A_x. The temporary premium to run for n " years would be A_x^n. Lastly, the premium for the whole of life would " be symbolized by A_x^∞, or by some other simple symbol as A_x^0.

" This second method would be more mathematical than the first, " because there is a real continuity between the single premium, the " premiums payable for 2, 3, 4, &c. years, and lastly the whole-life " premium, which would then be respectively symbolized by

$$A_x^1 \; A_x^2 \; A_x^3 \; . \; . \; . \; A_x^n \; . \; . \; . \; A_x^\infty \text{ or } A_x^0.$$

" But in rapid writing these small figures might be confounded " either with those placed above the lower indices, for instance, in " contingent assurances, such as A_{xy}^1 or A_{xy}^2; or with accents, such as " A'_x, a'_x.

" (5.) In the publications of the Institute of Actuaries loaded " premiums are often designated by P′, A′, and a'. I think it would " be well to generalize this usage and to designate by P′ P″ A′ A″ " a' a'' the commercial premiums and the valuation premiums.

" (6.) I now come to the symbols of the commutation tables. " Here only one criticism is possible, but I think it cannot be disputed. " Why designate by N_x the sum $D_{x+1} + D_{x+2} +$ &c., whilst all other " symbols designating summation, begin with the age x itself? Here " we have a source of weariness and regrettable confusion. The " Americans and the French have adopted for N_x the sum $D_x + D_{x+1} +$ " &c., following the system of Barrett and of Tetens, so that the " method of G. Davies is only employed in England. This method is " condemned by the Institute of Actuaries itself in its *Text-Book* " (page 109 of the French translation), and is only preserved as a " matter of routine! The time seems to me to have arrived to reject " it, and render uniform the system of symbols adopted for commu- " tation.

" (7.) Lastly, I arrive at the double notation r and v, the one

" designating $(1+i)$, and the other $\frac{1}{1+i}$. This double notation is " quite unnecessary. Let us designate $1+i$ by r so as to shorten the " formulas. That is an excellent simplification, especially as i is " seldom employed independently of unity. But what is the use of " using v which can be represented quite naturally by r^{-1}. What " mathematician, even a novice, would not understand what is meant " by the negative exponent? I therefore think it useful to reduce " the number of symbols in suppressing v. So also for d, which " represents $1-v$. That is a symbol very little required, and, moreover, " d represents elsewhere the number of deaths. It is evidently " vexatious to give two meanings so very different to the same letter.

" (8.) There remain to me still some few observations to make " on the subject of varying assurances or annuities, as also on the " subject of sickness assurances, but I do not wish to trespass too " much on the patience of my colleagues, and for the moment will " here end my criticism.

" Perhaps I shall be considered rash to propose to reform on a " few points the carefully elaborated work of the most eminent of our " professional brethren across the Channel. I excuse myself in " declaring once more that I consider this work to be one of the most " remarkable productions of actuarial science, and I think I best show " for it my respect in pointing out the few imperfections which seem " to me to spoil the proportions of the edifice.

" M. Laurent thought that a uniform notation is troublesome, and " uselessly loads the memory, when it is so easy to explain, at the " commencement of a paper or book, the meaning of the symbols of " which use is made.

" M. Marie replied that there was no question of adopting a " complicated uniform notation, but merely unchangeable symbols to " represent the functions in most general use. An entirely free " notation presents this inconvenience, which he himself had " experienced, namely, that in reading a work written in a foreign " tongue, we may be very much troubled to understand even the " explanation of the author as to the meaning of the symbols employed. " On the other hand, when that meaning is already known, one " frequently can follow the ideas of the author by means only of the " succession of formulas which accompany the text.

" M. Poterin du Motel made a few observations on some of the " symbols in the English notation relating to the order of survivorship. " That order is designated sometimes by vertical bars, sometimes by " small figures placed above or below the principal symbols. These " two methods do not always result in duplication, but some functions " can only be denoted by making use of both simultaneously, as in " $a^{1}_{xy|z}$. That arises from the fact that each one of these signs " indicates two different things, for example, in the symbols $A_{x|y}$ and " A^{2}_{xy}, which are equivalent to each other, the vertical bar, as also the " index 2, denote not only that the order of death must be $x\,y$, but " also that the sum assured must be payable at the death of y. There " thus results a kind of confusion in the use of the symbols, and it " would certainly be clearer to employ two different signs, each " one having its own meaning; the one to represent solely the order

" of death, and the other the life, on the falling-in of which the " sum assured becomes payable."

For greater convenience let us take up the criticisms made by M. L. Marie, in the order in which he himself gave them.

1.—*The inconvenience of the Double Symbol for the same Function* $A_{x\overline{n}|}^{1}$ *and* ${}_{n}E_{x}$, $a_{x\overline{n}|}$ *and* ${}_{|n}a_{x}$.

We may here remark that the symbols $A_{x\overline{n}|}^{1}$ and $a_{x\overline{n}|}$ have not been invented, but arise in consequence of a remark (*Text-Book*, Ch. vii, Art. 50) allowing in a formula the substitution of a term certain for a life. If ${}_{n}E_{x}$ (a symbol in which n has the same meaning as in ${}_{n}p_{x}$) has existed, it is, no doubt because the endowment is the first conception of actuarial science. Let us not forget that the notation of the Institute of Actuaries is of principal use in teaching, and that the professor who should begin by writing the symbol $A_{x\overline{n}|}^{1}$ before having spoken of assurances, would be liable not to be understood by his audience. It is the same with $a_{x\overline{n}|}$, for the student not yet knowing of annuities on joint lives.

Certainly, if any two symbols, one A, and the other A, for example, were to represent the same function, there would be a useless loading of the memory, and the retention of the two symbols could not be defended; but this is not the case here. The English notation is essentially pictorial, and neither $a_{x\overline{n}|}$ nor ${}_{|n}a_{x}$ requires the least effort of memory from anyone understanding the principles of the notation. Thus ${}_{|n}a_{x}$ shows that zero years will intervene (and the transaction is, therefore, immediate). Then, in the combination represented by ${}_{|n}a_{x}$, the transaction has to run for n years; $a_{x\overline{n}|}$ shows that the payment of the annuity depends on the joint existence of the life (x) and the term $\overline{n}|$. Under these conditions, it does not seem to me that we have any right to blame this wealth of symbols against the English notation, any more than synonyms against a literary language.

Let us remember, moreover, that ${}_{|n}a_{x}$ allows us to write and to read ${}_{m|n}a_{x}$ (a temporary deferred annuity).

Nevertheless, the didactic reason seems to me strongest for retaining ${}_{n}E_{x}$ and ${}_{|n}a_{x}$, because we are recommended to employ preferably the symbols derived from the substitution of a term-certain for a life (*Text-Book*, Ch. vii, Art 50).

2.—*Suppression of Indices placed to the left of the symbols.*

If it were possible to suppress all indices to the left I should agree with M. Marie; but I do not think that we can go to this length. In fact, if p_{x}^{n} (French notation) represents as clearly as ${}_{n}p_{x}$ (English notation) the probability that x will live n years, I do not see how, without using left-hand indices, or without liability to confusion, to represent probabilities a little more complicated, such as ${}_{n}p_{\overline{xy}}^{1}$ (the probability that the survivor of (x) and (y) will live n years), or ${}_{n}p_{xy}^{[1]}$ (the probability of the lives (x) and (y) one only will be alive at the end of n years). To these probabilities there are corresponding annuities expressed according to the same law, of which one, $a_{xy}^{[1]}$ is a reciprocal survivorship annuity sometimes granted by life assurance companies.

And even if we look at only the simple annuity, it is necessary to be able to indicate, first, the age of the life upon which it depends, second, the limitation of the payments (deferred, temporary, &c.), third, the frequency of the payments. We are, therefore, forced to place on the left one of these indices.

The adoption of $A_{\overline{n}|}$ for an assurance for a fixed term, which is equal to v^n, is very reasonable.

As to the suppression of the abbreviation ${}^{u}l_{xyz}$, its use is principally theoretical, in operations relating to a great number of lives. Elementary instruction being limited most frequently to two lives, one could very well do without such abbreviation.

3.—*Suppression of symbol A in the expression for the annual premium for the paid-up policy, &c.*

I am entirely in agreement with M. Marie. The liberty allowed to authors to represent the annual premium by the letter P standing alone, or attached to the symbol for single premiums, as $Pa_{y|x}$ (*Text-Book*, French edition, p. 49) should be changed into a rule, and it should be compulsory always to combine the two symbols, 1st, because there are operations which necessitate this combination, such as reversionary annuities, deferred life annuities, &c., for which the annual premiums must be represented by $Pa_{y|x}$, and $P_{n|}a_x$, or $Pa_{\overline{n}|x}$; 2nd, because it is possible that the number of premiums contracted for may be less than the number of years for which the assurance is to run; such are all benefits at uniform annual premiums for decreasing sums assured, and such are endowment assurances for n years for which the premiums are only to be payable for n' years.

Thus, it would be logical to indicate on the symbol P everything which has reference to the manner of payment of premiums, the next following symbol always being that representing the single premium.

Thus, ${}_{n'}P^{(2)}A_{x\overline{n}|}$ would represent the premium per annum, payable half-yearly for n' years, for an endowment assurance for n years on (x).

Although the index, which is placed on the right of P, can never be erroneously attributed to A, we could, nevertheless, decide upon always separating the two symbols by a point, thus: ${}_{n'}P^{(2)}.A_{x\overline{n}|}$; but this would be useless, and might lead to a supposition that ${}_{n'}P^{(2)}$ was to be multiplied by $A_{x\overline{n}|}$, a mistake, nevertheless, not to be much feared because ${}_{n'}P^{(2)}$ has no meaning by itself. What we have just said of P is also applicable to V, the policy-value or mathematical reserve; to (FP), the paid-up policy, which, with M. Marie, I should like to see designated by F; and to G, the surrender-value.

Not having suppressed, as we have just said above, the index to the left, we should therefore write—

${}_nVA_x$ or ${}_nV.A_x$, ${}_nFA_x$ or ${}_nF.A_x$, ${}_nGA_x$ or ${}_nG.A_x$, for the mathematical reserve-value, the paid-up policy, the surrender-value after n years, of a whole-life policy on (x).

4.—*To use the symbol A by itself.*

This method of representing functions is, as the author himself says, unhappily impossible, because there would be the liability to confuse A^2_{xy}, the single premium of assurances payable on death of (x) if he

survive (y), with A^2_{xy} which, according to the proposed new system, would be the annual premium payable for two years only for an assurance on joint lives (xy). We shall, therefore, say no more on this point.

5.—*Net, Valuation, and Office Premiums.*

Here, again, I am in agreement with M. L. Marie, and in my report presented to the Congress in 1895 (Report No. 1, p. 12, "The Proceedings of the First Congress of Actuaries"), I advocated the adoption of the symbols

P, A, a for the net premiums.
P′, A′, a' for valuation premiums.
P″, A″, a'' for office premiums.

Under this head let it be noticed that the surrender-value is in reality the market value of the mathematical reserve, and therefore we could by analogy represent it by V″. The introduction of symbol G, suggested in the 3rd heading above, would thus become unnecessary.

6.—*The adoption of* N_x *of the system of Barrett and Tetens.*

Should we adopt for N_x the sum of the values of D from D_x, or from D_{x+1}?

Each one of these methods has had, and still has, its advocates and opponents. Each one has its advantages and its disadvantages; the one destroys the symmetry of annuity formulas, and the other that of assurance formulas. It would be wearisome to re-state on this subject all that has been said elsewhere (*J.I.A.*, vol. x, p. 301, and vol. xiv, p. 200, and also the Proceedings of the last Congress; for instance, the report of Mr. I. C. Pierson, "Proceedings of the 1st International Congress of Actuaries", I, pp. 17 to 22).

The only solution to these questions is that given by the Institute of Actuaries, namely, the adoption of the two symbols.

$$N_x = D_{x+1} + D_{x+2} + \&c.$$
$$\mathbb{N}_x = D_x + D_{x+1} + \&c.$$

American actuaries prefer the antique letter **N**, more easy to print. English actuaries (*J.I.A.*, 1896, vol. XXXIII, p. 37) the open $\mathbb{N}$, because of the difficulty of distinguishing in manuscript **N** and N. Yet from the practical point of view this is of very little importance; a glance at the value of N_x at the limiting age of the table showing at once the principle according to which the table is calculated.

7.—*Suppression of symbols v, d.*

The suppression of $v = \frac{1}{1+i}$ is asked for on the plea that there already exists a symbol $r = (1+i)$. If this is the only reason, as the sign r is never used, whilst v is met with at every turn, I reject the proposal, and ask that v should be retained, and that we should give up the use of r for $(1+i)$.

In fact, all calculations relating to annuities or assurances have for object the determination of the present value of the benefits, that is to say, the single premium.

This quantity being always the sums of the mathematical expectations of the different payments composing it, it is natural to adopt a special symbol for the discounted value of unity. Moreover, v is in practice very useful, because written for $(1+i)^{-1}$ it replaces seven

printed characters by one only. I would even add that the use of v is so natural that the regretted M. Mahillon, in the calculations made, in 1886, in preparing the new tables of the Caisse de Retraite of Belgium, made use of a to avoid employing $(1+i)^{-1}$ and its powers which appeared in each line.

As to d written for $(1-v)$, the reason for its introduction arises more particularly from the necessity in which we are placed to represent in the most simple case the value of the discount, to arrive finally at δ, the momently rate, the basis of the continuous method of calculating the values of annuities and assurances. Moreover, the introduction of d in the formulas for A_x and P_x (*Text-Book*, Ch. vii, Articles 43, 58, 59, 61, 62, and 64) gives to these formulas interpretations so elegant and so suggestive to the student, that we are tempted to excuse it. Lastly, the introduction of d into these formulas facilitates greatly the setting forth of conversion tables, and the theory of life interests and reversions (*Text-Book* VIII and XIX). But it is impossible to confound d (the discount) with d (the number dying), the first not being capable of having any index other than the rate of interest as $d_{(i)}$.

The observation of M. Poterin du Motel is quite right. It must, however, be remarked that, in the *Text-Book*, neither in Ch. xiii (Contingent or Survivorship Assurances) nor in Ch. xv (Compound Survivorship Assurance) has the vertical bar been employed to separate the statuses. Always use has been made of figures placed above or below the lives in question. It is only in the case of compound survivorship annuities that such symbols as $a^1_{xy|z}$ appear, but is there any means of avoiding this? I do not think so, the index including lives regarding which we are required to represent the probabilities of continued existence, and, at the same time, others of which we are required to represent the probabilities of death in a determinate order. But it must be noticed that this expression can be read with as much facility as if it were written out in words at full length. In fact, it is an annuity to be drawn by (z), commencing at the death of (x) if he die before (y). It is sufficient to remember that the figure placed above the letter in the symbol designates the life on the falling-in of which the annuity is to be entered upon, or the sum assured paid.

Conclusions.

Without occupying ourselves, as M. Marie says, with benefits essentially British, if we eliminate from the report of our French colleague the 4th heading, which he himself sees to be impossible, and the 6th, for which sanction already exists, there remain only five headings, 1, 2, 3, 5, 7. In so far as 1 and 2 are concerned, we think it has been shown that, whilst admitting that his remarks are well grounded, it is not possible entirely to meet him.

As to 3 and 5, I am in entire agreement with him.

As to 7, I beg of him to accept the good reasons which I have given for the adoption of v and d.

It only remains, therefore, to ask the Institute of Actuaries to examine carefully, and in a friendly spirit, the small modifications which we have proposed, and we may hope that, as in 1895, there may be a unanimous vote of the Congress for the adoption of a universal notation.

On a Universal Notation. By George King, F.I.A., F.F.A., *Actuary of the London Assurance Corporation.*

At the International Actuarial Congress, held at Brussels in September 1895, the question of a Universal Notation was discussed, and the following resolutions were unanimously passed, namely—

1. The Notation of the Institute of Actuaries shall be employed in preference by the actuaries of all countries.
2. Such modifications thereof as shall be found necessary shall be considered at future Actuarial Congresses.

At this Congress it is, therefore, natural that the question should again be brought forward; and, seeing that we all seek the best that is possible for our profession, it is to be hoped that we may again find ourselves in perfectly unanimity.

Since the Congress of 1895, the position has somewhat altered. In the volume of Institute of Actuaries' Life Tables, published in 1872, the Institute Notation first took concrete shape, a detailed list of symbols appearing in an appendix to that volume; but as far as I know, although doubtless the volume has circulated widely, the appendix has never been translated into any European language, and, moreover, it contains little more than a list of symbols, without explanation of the connection between one symbol and another. It is not to be wondered at that, under these circumstances, many Continental actuaries have been led to think that the Institute Notation is arbitrary and confused. But a little before the date of the Congress in 1895, the French translation of the Institute of Actuaries' *Text-Book*, Part II, appeared, and at the beginning of that volume there is a restatement of the Institute Notation in much briefer form; wherein, not lists of symbols, but the principles on which they are constructed, are set forth. The French translation has now for more than three years been in the hands of Continental actuaries, and they have thus had the opportunity of becoming more familiar with the Institute system. To this cause, I think, is due the much greater appreciation of that system which now seems to exist, and I am in hopes that, when the system has been still further studied and understood, it will even more increase in favour. I take this opportunity of conveying to our foreign colleagues, and more particularly to Messrs. Marie and Bégault, the thanks of British actuaries for the very friendly terms in which their work has been referred to. It is very gratifying to them that their efforts have been received in such a generous spirit; and I am sure

that they will thereby be encouraged in their labours on behalf of that science to which we are all so deeply attached.

It must be remembered that the Institute of Actuaries' Notation is not a mere collection of arbitrary symbols, like Chinese writing, where each word is represented by a separate sign, unconnected with other words of similar sound. Rather, the Institute of Actuaries' Notation is an alphabet, by means of which the actuarial language can be, as it were, phonetically written, in such way that anyone knowing the alphabet, which, moreover, is not a lengthy one, can at once read any symbol, although it may, in itself, be new to him. An excellent illustration of this point is that, while the symbol $A_{n|}$ is not specifically given in any of the lists of the Institute of Actuaries' Notation, yet no one acquainted with that Notation could fail instantly to understand it at the first glance. It really, although not included in even the most detailed catalogue, is part of the Institute of Actuaries' Notation, because everyone knowing that Notation, is aware that A is the symbol for an assurance, and the suffix $\overline{n|}$ is the symbol for a term certain of n years; so that $A_{\overline{n|}}$ is seen at once to mean an assurance payable at the end of n years certain. The simple and graphic nature of the Institute Notation could not be illustrated in a more elementary manner.

Before writing this paper, I have had the advantage of seeing a proof of that of M. A. Bégault, also to be submitted to the present Congress; and as that proof contains a lengthy quotation from M. Léon Marie, who is, in this respect, the representative of French actuaries, I am entitled to assume that we have before us all that it is thought necessary to say, on the present occasion, on the subject.

I wish to reiterate that in suggesting that the Institute of Actuaries' Notation should now be finally adopted, we are not proposing a long list of arbitrary symbols, but merely a philosophical principle of writing the actuarial language, which is easily understood, easily remembered, easily written, easily taught, and is, moreover, flexible and elastic. There seems to me a most unusual consensus of opinion that the Institute Notation is the best, and I, therefore, imagine that the only question now before us is, as to whether it is desirable at present to introduce any minor modifications. The criticisms of M. Marie, and the paper of M. Bégault, show that any changes which may be proposed are confined within very narrow limits.

Following M. Bégault's example, I take up M. Marie's suggestions in their order.

1. M. Marie proposes that such symbols as ${}_nE_x$ should be dropped, and that functions of this description should be written in the form $A_{x\overline{n|}}^{\ 1}$. English actuaries will no doubt agree that the second of these forms is the more convenient, and as a matter of fact probably it is the form in almost universal use; but M. Bégault has pointed out a very good reason for retaining also the more specific notation for such functions, because it would be difficult in teaching an elementary class to explain the symbol in its survivorship shape, and it is only later on in his studies that the student will have sufficient knowledge to grasp the idea.

I, therefore, agree with M. Bégault that, while it is desirable as far as possible to use the more graphic and the more instructive form, $A_{x\overline{n}|}^{1}$, yet it would be unwise entirely to give up the other.

2. I think we shall all be at one with M. Marie that suffixes to the left of a symbol are inconvenient, and should be avoided as far as possible; but I imagine we shall also agree with M. Bégault that there are cases where these cannot be dispensed with, and, therefore, that it would be unwise to pass a resolution abolishing them. I may point out, as showing the wonderful adaptability of the Institute Notation, that even the deferred temporary annuity, ${}_{n|m}a_x$ may be written as a survivorship function, thus, $a_{\overline{n}|\,x;\,\overline{n+m}|}$; but who would think of submitting such a symbol for the consideration of a first year's student? Under heading 2, M. Marie has also considered the question of indices above and to the left of the function, to denote an increase in the age of all the lives involved. This method of denoting an increase in age is very little used, and but little convenience would be lost if it were ruled out as inadmissible. Nevertheless, there are some cases where it presents advantages, and seeing that the point is a very small one, I do not think it would be judicious to lay down a strict law. We shall all naturally avoid, as far as possible, the use of such indices, but on the rare occasions when they are used they will be easily understood.

3. M. Marie has proposed that it should be made obligatory to use a compound symbol, consisting of the letter P attached to the symbol of the principal function, for all annual premiums; and M. Bégault appears to agree with him, and to support him in this view. I would, however, most respectfully ask leave to differ, and to point out that, were the suggestion adopted, a great deal more writing and printing would be involved in the great majority of actuarial investigations, than is necessary when permission is given to use the letter P alone. Moreover, I cannot help feeling that the annual premium is an entity in itself, which may be looked at in many aspects without direct reference to the single premium for the benefit. (See, for instance, *Text-Book* Ch. viii, Art. 28). To explain my meaning further, it is sufficient for me to call attention to the connection between the premium and the annuity, where the single premium is not involved, namely—

$$\mathrm{P} = \frac{1}{1+a} - d,$$

or

$$a = \frac{1}{\mathrm{P}+d} - 1,$$

and, as explained in the *Text-Book*, Ch. viii, Art, 33, the equation holds in all cases where the annuity is 1 per annum, the assurance unity, the annual premium uniform

throughout the whole duration of the status, and the assurance certainly payable one year after the last payment of the annuity. It therefore holds for annuities-certain. It therefore seems to me that we should make a mistake in abolishing altogether the symbol P standing by itself, and, similarly, such other symbols as V, &c. Where the benefit is of such a nature that the necessary description of it can be given by affixes or suffixes round the P or V, &c., without bringing in the symbol for the single premium, it is much better, and much more elegant, and much more convenient, to adhere to the simpler form. The compound form, such as $Pa_{y|x}$, is required only in the case of complicated or special benefits, and is, therefore, the exception rather than the rule.

4. M. Marie, under his heading No. 4, refers to another method of expressing periodical premiums, but as he admits that in certain serious aspects it would be inconvenient and confusing, and as M. Bégault has dealt with the point, I need not further refer to it.

5. The suggestion of M. Marie that P, A, and a should be used to represent net premiums, P′, A′, and a' valuation premiums, and P″, A″, and a'' commercial premiums, entirely falls in with the use of such symbols in the Institute of Actuaries' Notation, as shown in the *Text-Book*, and therefore does not require a special resolution to confirm it. Moreover, such special resolution would, in my opinion harden the Institute of Actuaries' Notation, and render it less elastic, and, therefore, less convenient; because there are many other special premiums, &c., which require in particular investigations to be distinguished from the net functions; and it is very convenient to have opportunity to use accentuated letters to denote them. On this point I need only refer to Chapter xviii of the *Text-Book*, where accentuated letters are freely used. Thus, in Article 25 of that chapter we have V′ employed to represent a policy-value subject to a loaded (that is a commercial) premium, and that policy-value being capable of being viewed in two aspects, there is also employed the symbol V″. Similarly in Article 34, P′ is used to represent the office premium, and letters similarly accentuated are employed for the functions connected therewith. Sometimes, in comparing mortality tables, functions by one table must be distinguished from those of another, and here accents are very convenient. It is only in a limited number of investigations that office premiums and valuation premiums come in, while in many other investigations functions of a similar kind appear; and, therefore, I would go a little further than does M. Marie, and suggest that the principles of the Institute of Actuaries' Notation be adhered to by using the unaccentuated Roman letters for net functions, and the accentuated letters, &c., for special functions of a similar kind. As these principles are already embodied in the Notation, there is no need to pass a resolution on the subject. Here, also, I may point out that in some investigations, where policy-values of many kinds

are being compared, the letter U is very useful, and, in fact, almost necessary.

6. I am in entire accord with M. Marie as to the inconvenience of the British form of the letter N which is used to represent the sum of D from age $x+1$ upwards, and I think it is much to be regretted that Barrett's form of summation was rejected in favour of that of Davies'. From the point of view of assurances, no one will dispute that the initial form of N is much preferable to the terminal, and I think that even from the point of view of annuities the same may be said. For instance, $\frac{N_{x+n}}{D_x}$, under Davies' form, represents an annuity to be *entered on* at the end of n years, the first payment of which is to be made at the end of $n+1$ years; but this is confusing to the student, who is apt to think that the first payment must be made at the end of the deferred period. Under Barrett's form the same annuity would be represented by $\frac{N_{x+n+1}}{D_x}$, and this would convey a much clearer idea of the real conditions. As stated in the *Text-Book* it is, however, too late to go back upon what already has been done; and it would be a great mistake to apply the symbol N_x to a different form of summation. It must, moreover, be remembered, that the Congress is now considering, not forms of summation, but only notation; and in the matter of the notation for the commutation columns it is the Americans and the French who are the innovators. When Davies introduced his form of summation, he properly employed a new symbol for it, and his symbol should not be used for a column of another kind. But, as explained by M. Bégault, the solution of the difficulty is easy. Let N_x be used to denote the terminal form of the function, and a different kind of N, whether that used in Great Britain or in America does not matter, for the initial form. There could then be no confusion, and the large library of publications which have been issued with the terminal form would not be interfered with. America has adopted for the initial form **N**, while Great Britain implicitly has adopted $\mathbb{N}$. Either of these would do, and there can be no confusion by leaving it optional to use either.

7. M. Maries' last criticism relates to the symbols v and d for the discounted value of a unit, and the discount; and I hope he will fall in with the suggestion of M. Bégault, and not press his objection to them. The discounted value is, perhaps, the function of interest which is most common in actuarial investigations, and to have a definite symbol for it is very important and very convenient. The letter r for $(1+i)$, does not occur in the Institute of Actuaries' Notation, and its absence is not felt, because $(1+i)$ is so easily written and so easily printed, and is so descriptive, that there is no real need to substitute a single symbol for it. Nevertheless, if it were the special wish of Continental actuaries to use the

letter r for $(1+i)$, I feel sure that English actuaries would offer no opposition. We should thus have the alternative forms

$$v=r^{-1} \text{ and } r=v^{-1}$$

and I can well see that it might sometimes happen that their use would be convenient, and might in some cases bring out hidden meanings that would not otherwise have been apparent.

As to the symbol d for discount, that is rather a pet of mine, and I should much regret its disappearance. May I refer here to my little work on the Theory of Finance, where, in chapter i, the rate of discount is shown to be an independent entity requiring a symbol of its own. Moreover, its equivalents $1-v$, $\frac{i}{1+i}$., vi, although numerically identical, have different theoretical meanings; just as in music, A sharp and B flat represent an identical note on the piano; yet to the musician they have quite different significations. No confusion between d the discount and d the number dying can arise, because they never occur together, and the nature of the formula always shows, without possibility of mistake, which is meant. I have no doubt that, with the explanations given by M. Bégault and myself, this point will be accepted.

From what I have written, it will be seen that, in my opinion, all the wishes of M. Marie, and I presume also of his colleagues, are already included in the Institute of Actuaries' Notation. That Notation is, I think, more elastic and all-embracing than has been sometimes supposed; and there is no need to limit it in order to meet special requirements. Rather let it remain free; and in unusual investigations, where specially modified functions come in, let there be the necessary accents, &c., added (with explanations), to render the Notation exactly applicable.

I reiterate that in adopting the Institute of Actuaries' Notation, it is not a long catalogue of arbitrary symbols that is being selected, but that adherence is being given to a few general laws of almost universal application. When new operations arise, the system of notation will naturally adapt itself to the occasion; and it will be easy then to give the necessary expansion to the system. I hope, therefore, that the first of the resolutions of the Brussels Conference may now be affirmed, and that the second, in a slightly enlarged form, may be adopted.

It must be admitted that in some respects the system of notation is not yet complete, and more especially I would refer to sickness benefits. Sick pay may be limited both as to the years of age for which it is to be granted, and as to the portion of the illness which will entitle to it; but at present no symbols have been suggested to denote this difference. I fear, however, that the actuaries of different countries are scarcely as yet sufficiently acquainted with the methods of their neighbours to be able usefully to construct a full notation for sickness benefits. At the present Congress, several most able and interesting papers are submitted upon the Friendly Societies of different countries; and in time, no doubt, such a mass of knowledge will be accumulated as will render the expansion of the symbols for sickness benefits, following the principles of the rest of the Institute

Notation, possible and useful. The time, however, has scarcely as yet arrived.

I now submit for consideration the following resolutions:

(1) That the Notation of the Institute of Actuaries shall be employed in preference by the actuaries of all countries.
(2) That such expansions and improvements thereof, as the continually extending sphere of actuarial science may render desirable, shall be considered at future Congresses.
(3) That the Notation, as now approved, be printed in the Transactions of the Congress.

[*Traduction.*]

A propos d'une Notation universelle.

PAR GEORGE KING, F.I.A., F.F.A., Actuaire de la "London Assurance Corporation."

Au Congrès international d'Actuaires, tenu à Bruxelles en septembre 1895, la question d'une notation universelle a été discutée, et les résolutions suivantes ont été votées à l'unanimité, savoir :

1°. La notation de l'Institut des Actuaires (de Londres) sera employée de préférence par les actuaires de tous les pays.

2°. Les modifications que l'on reconnaîtrait nécessaire d'y apporter dans l'avenir seront examinées dans les prochains congrès internationaux.

Il est donc naturel que la question soit de nouveau soumise au présent congrès ; et comme nous désirons introduire tous les perfectionnements possibles utiles à notre profession, il est à espérer que nous nous trouverons encore en parfaite unanimité.

Depuis le Congrès de 1895 la situation a quelque peu changé. Dans le volume des Tables de Mortalité de l'Institute of Actuaries, publié en 1872, la notation de l'Institut a reçu, pour la première fois, une forme concrète, une liste détaillée de symboles figurant en appendice à ce volume ; mais, pour autant qu'il est à ma connaissance, bien que le volume ait sans doute beaucoup circulé, l'appendice n'a jamais été traduit en aucune langue européenne, et, d'ailleurs, il ne contient guère qu'une liste de symboles, sans expliquer les relations rattachant les symboles entre eux. Il n'est pas étonnant que, dans ces conditions, beaucoup d'actuaires du continent aient été amenés à penser que la notation de l'Institut est arbitraire et confuse. Mais, un peu avant l'époque du Congrès de 1895, apparut la traduction française du 2^{d} volume du 'Text-Book' de l'Institute of Actuaries, et au commencement de ce volume figure une récapitulation de la notation de l'Institut ; on y a fait l'exposé, non des listes de symboles, mais des principes de leur écriture. Voilà plus de trois ans que la traduction française se trouve entre les mains des actuaires du continent, qui ont eu ainsi l'occasion de se familiariser davantage avec le système de l'Institut. C'est à ce fait qu'il faut attribuer, je pense, la faveur croissante que semble rencontrer ce système, et j'espère que lorsqu'il aura été étudié davantage et mieux compris, il trouvera des partisans de plus en plus nombreux. Je saisis cette occasion pour transmettre à nos collègues étrangers, et plus par-

ticulièrement à Messieurs Marie et Bégault, les remercîments des actuaires anglais pour les termes très amicaux dans lesquels ils se sont exprimés au sujet de leur œuvre. Ils constatent avec beaucoup de satisfaction que leurs efforts ont trouvé un accueil si généreux ; et je suis sûr que ce sera pour eux un stimulant dans les labeurs qu'ils consacrent à cette science à laquelle nous sommes tous si profondément attachés.

Il faut se rappeler que la notation de l'Institute of Actuaries n'est pas qu'une réunion de symboles arbitraires, comme l'écriture chinoise, où chaque mot est représenté par un signe spécial, sans rapport aucun avec d'autres mots de même son. La notation de l'Institute of Actuaries est plutôt un alphabet, au moyen duquel la langue actuarielle peut être, on peut dire, écrite phonétiquement, de telle façon que toute personne connaissant l'alphabet, lequel, du reste, n'est pas long, peut lire de suite n'importe quel symbole, bien que celui-ci, par lui-même, puisse être une nouveauté pour le lecteur. Ce qui le prouve clairement, c'est ce fait que le symbôle $A_{\overline{n}|}$, sans être spécialement indiqué dans aucune des listes de la notation de l'Institute of Actuaries, est cependant compris au premier coup d'œil par celui qui est au courant de la notation. Ce symbole, bien qu'il ne figure pas même au catalogue le plus détaillé, fait cependant partie de la notation de l'Institute of Actuaries, parce que toute personne connaissant cette notation sait que A est le symbole d'une assurance, et que l'indice $\overline{n}|$ est le symbole d'un terme certain de n années ; d'où l'on voit de suite que $A_{\overline{n}|}$ signifie une assurance payable certainement au bout de n années. On ne pourrait démontrer plus clairement la nature simple et graphique de la notation de l'Institut.

Avant d'écrire le présent rapport, j'ai eu l'avantage de voir une épreuve du travail de M. A. Bégault, à soumettre également à ce Congrès ; et comme cette épreuve contient une assez longue citation de M. Léon Marie, qui est, à cet égard, le représentant des actuaires français, j'ai le droit de prétendre que nous avons devant nous tout ce qu'il semble nécessaire de dire, quant à présent, à ce sujet.

Je désire répéter qu'en proposant d'adopter maintenant d'une manière définitive la notation de l'Institute of Actuaries, nous ne proposons pas une longue liste de symboles, mais simplement un principe philosophique pour écrire la langue actuarielle, qui soit facile à comprendre, facile à retenir, facile à écrire, facile à enseigner, et, en outre, flexible et élastique. C'est, me semble-t-il, un très rare consensus d'opinion que la notation de l'Institut est la meilleure, et c'est pourquoi j'estime que la seule question qui se pose à nous, est de savoir s'il est désirable d'introduire en ce moment quelques légères modifications. Les critiques de M. Marie et le rapport de M. Bégault montrent que tous les changements qui pourraient être proposés se confinent dans des limites très étroites.

Suivant l'exemple de M. Bégault, je rélève les observations de M. Marie dans l'ordre où elles sont présentées.

1°. M. Marie propose que les symboles tels que ${}_nE_x$ soient abandonnés, et que les fonctions ainsi exprimées soient écrites dans la forme $A_{x\overline{n}|}^{\ 1}$. Les actuaires anglais conviendront sans doute que la seconde de ces formes est la plus convenable, et, de fait, c'est probablement la forme presque universellement usitée ; mais M. Bégault a signalé une

très bonne raison de conserver également la notation plus spécifique pour ces fonctions, parce qu'il serait difficile, donnant l'enseignement à une classe élémentaire, d'expliquer le symbole dans sa forme de survivance, et ce n'est qu'en poursuivant ses études que l'étudiant aura assez de connaissances pour saisir l'idée.

J'estime donc avec M. Bégault que, s'il est désirable d'employer autant que possible la forme plus graphique et plus instructive, $A_{x\,\overline{n}|}^{\,1}$, il serait cependant peu sage d'abandonner entièrement l'autre.

2°. Je pense que nous serons tous d'accord avec M. Marie, que les indices à gauche d'un symbole sont gênants et devraient être évités autant que possible ; mais j'imagine que nous conviendrons aussi avec M. Bégault qu'il y a des cas où l'on ne peut s'en passer, et qu'en conséquence, il serait peu sage de voter une résolution tendant à les abolir. Pour montrer l'étonnante adaptabilité de la notation de l'Institut, je ferai remarquer que même la rente temporaire différée, ${}_{n|m}a_x$ peut s'écrire, sous la forme de survivance, $a_{\overline{n}|}\,|_{x:\overline{n+m}|}$; mais qui songerait à soumettre pareil symbole à l'examen d'un étudiant de première année? Dans le § 2, M. Marie examine également la question des indices au-dessus et à gauche de la fonction, pour exprimer un accroissement dans l'âge de toutes les vies impliquées. Cette méthode de noter un accroissement d'âge est très peu usitée, et l'on ne perdrait que peu de facilité en décidant comme règle de ne pas l'admettre. Néanmoins. il y a certains cas où elle présente des avantages, et comme je vois que le point est peu important, je ne crois pas qu'il serait judicieux de poser une règle stricte. Naturellement, on évitera autant que possible d'en faire usage, mais dans les rares occasions où elle sera employée, elle sera facilement comprise.

3°. M. Marie a proposé de rendre obligatoire l'usage d'un symbole composé, consistant dans la lettre P réunie au symbole de la fonction principale, pour toutes les primes annuelles ; et M. Bégault semble être du même avis, et appuyer cette manière de voir. Cependant je demanderai bien respectueusement l'autorisation de différer sur ce point, et de faire remarquer que si la proposition était adoptée, elle impliquerait un énorme supplément d'écritures et d'impressions dans la grande majorité des recherches actuarielles, ce qui est évité lorsqu'on peut faire usage de la lettre P seule. De plus, je ne puis m'empêcher de penser que la prime annuelle est une entité par elle-même, que l'on peut considérer à divers points de vue sans aucune relation avec la prime unique d'une combinaison. (Voir, par exemple, 'Text-Book,' ch. viii. § 28.) Pour mieux expliquer mon opinion, il me suffit d'attirer l'attention sur la relation qui existe entre la prime et l'annuité, là où il ne s'agit pas de prime unique, savoir :—

$$\mathrm{P} = \frac{1}{1+a} - d,$$

$$\text{ou } a = \frac{1}{\mathrm{P}+d} - 1.$$

et, ainsi qu'il est expliqué dans le 'Text-Book,' ch. viii. § 33, cette équation existe dans tous les cas où l'annuité est de 1 par an, la somme assurée, l'unité, la prime annuelle fixe pour toute la durée du status et

l'assurance certainement payable un an après le dernier paiement de l'annuité. Elle est donc exacte pour les annuités certaines. Il me semble donc que ce serait une faute d'abolir entièrement le symbole P pris isolément, ainsi que d'autres symboles tels que V etc. Lorsque l'opération est de nature telle que sa description nécessaire puisse être donnée par des indices placés autour du P ou du V etc., sans introduire le symbole de la prime unique, il est bien préférable, bien plus élégant et plus commode de prendre la forme simplifiée. La forme composée, telle que $Pa_{y|x}$ n'est nécessaire que dans le cas d'opérations spéciales ou compliqués, et est donc plutôt l'exception que la règle.

4°. M. Marie, dans ce § 4, indique une autre méthode pour exprimer des primes périodiques, mais comme il admet que sous certaines formes elle présenterait des inconvénients et de la confusion, et comme M. Bégault a traité ce point, je n'ai pas à m'en occuper davantage.

5°. La proposition de M. Marie d'employer P, A et a pour représenter des primes pures, P′, A′ et a' des primes d'inventaire et P″, A″ et a'' des primes commerciales, est entièrement d'accord avec l'usage de pareils symboles dans la notation de l'Institute of Actuaries, ainsi que le montre le 'Text-Book.' Pour cette raison, il n'est pas nécessaire de voter de résolution spéciale pour la confirmer. Bien plus, à mon avis une telle résolution compliquerait la notation de l'Institute of Actuaries, et la rendrait moins élastique et, par là même, moins facile; parce qu'il y a certaines autres primes spéciales, etc., qui dans des recherches spéciales doivent pouvoir être distinguées des fonctions pures; et il est très facile de pouvoir employer des lettres accentuées pour les désigner. Sur ce point, il me suffit de me référer au chapitre xviii. du 'Text-Book,' où des lettres accentuées sont employées librement. Ainsi, à l'article 29 de ce chapitre, nous trouvons V′ représentant la valeur d'une police correspondante à une prime chargée (prime commerciale), et cette valeur de police pouvant être considérée à deux points de vue, on y a employé aussi le symbole V″. De même, au paragraphe 34, P′ est employé pour représenter la prime commerciale, et des lettres pareillement accentuées sont employées pour les fonctions qui s'y rapportent. Parfois, en comparant des tables de mortalité, des fonctions calculées au moyen d'une table doivent être distinguées de celles calculées au moyen d'une autre, et ici les accents sont d'un emploi très commode. Ce n'est que dans un nombre limité de recherches que les primes commerciales et les primes d'inventaire interviennent, tandis que des fonctions de même espèce apparaissent dans beaucoup d'autres recherches; et, pour ce motif, j'irai un peu plus loin que M. Marie, et proposerai que l'on adhère aux principes de la notation de l'Institute of Actuaries, qui consistent à employer les caractères romains non accentués pour les fonctions pures, et les lettres accentuées etc. pour des fonctions spéciales de même espèce. Comme ces principes font déjà partie de la notation, il n'y a pas lieu d'émettre un vote à ce sujet. Ici, je me permettrai également de faire remarquer que dans certaines recherches où des valeurs de polices de différentes espèces sont comparées entre elles, la lettre U est très utile, et de fait, presque nécessaire.

6°. Je suis entièrement d'accord avec M. Marie quant aux inconvénients de la forme anglaise de la lettre N qui est employée pour représenter la somme de D depuis l'âge $x + 1$ et au-delà, et je pense qu'il

est fort regrettable que la forme de sommation de Barrett ait été rejetée pour celle de Davies. Au point de vue des assurances, personne ne contestera que la forme initiale de N est préférable de beaucoup à la forme finale, et je crois que même en se plaçant au point de vue des annuités, on peut en dire autant. Par exemple, $\frac{N_{x+n}}{D_x}$, sous la forme de Davies, représente une annuité dont l'entrée en jouissance est dans n années, dont le premier paiement doit s'effectuer dans $n+1$ années; mais cela prête à confusion pour l'élève, qui est disposé à croire que le premier paiement doit être fait au bout de la période différée. Sous la forme de Barrett, la même annuité serait représentée par $\frac{N_{x+n+1}}{D_x}$, et ceci donnerait une idée bien plus claire des conditions réelles. Comme il a été dit dans le 'Text-Book,' il est, du reste, trop tard pour revenir sur ce qui a déjà été fait; et ce serait une grande faute que d'appliquer le symbole N_x à une forme de sommation différente. De plus, il faut se rappeler aussi que le Congrès examine actuellement non les formes de sommation, mais uniquement la notation; et dans la question de la notation pour les colonnes de commutation, ce sont les Américains et les Français qui sont les innovateurs. Lorsque Davies introduisit sa forme de sommation, il fit judicieusement usage d'un nouveau symbole pour l'exprimer, et son symbole ne devrait pas être employé pour une colonne d'une autre espèce. Mais, comme il a été expliqué par M. Bégault, la difficulté est facile à résoudre. Que l'on se serve de $\mathbb{N}_x$ pour représenter la forme finale de la fonction, et d'une espèce différente de N (peu importe que ce soit celle usitée en Grande-Bretagne ou celle en usage en Amérique) pour la forme initiale. Il ne pourrait y avoir de confusion alors, et les nombreuses publications parues dans la forme finale ne s'en trouveraient pas démodées. Pour la forme initiale, l'Amérique a adopté **N**, tandis que la Grande-Bretagne a implicitement adopté $\mathbb{N}$. Chacune de ces deux formes conviendrait, et il ne peut y avoir de confusion à laisser choisir l'une ou l'autre.

7°. La dernière critique de M. Marie se rapporte aux symboles v et d pour la valeur actuelle d'une unité, et pour son escompte; j'espère qu'il entrera dans les vues de M. Bégault, et qu'il n'insistera pas sur les objections qu'il y oppose. La valeur actuelle est, peut-être, la fonction de l'intérêt la plus commune dans les recherches actuarielles, et il est très important et fort commode d'avoir un symbole determiné pour la représenter. La lettre r pour $(1+i)$, ne se rencontre pas dans la notation de l'Institute of Actuaries, et son absence ne se fait pas sentir, parce que $(1+i)$ s'écrit et s'imprime si facilement, et est si descriptif, qu'il n'y a pas de nécessité réelle de lui substituer un symbole simple. Cependant, si les actuaires du continent désiraient absolument se servir de la lettre r pour $(1+i)$, je suis persuadé que les actuaires anglais n'y feraient pas opposition. Nous aurions ainsi les doubles formes,

$$v = r^{-1} \qquad \text{et } r = v^{-1}$$

et je vois bien qu'il se pourrait parfois que leur emploi fût commode, et fît ressortir en certains cas des significations cachées que l'on n'apercevrait pas sans cela. Quant au symbole d pour l'escompte, il est plutôt mon favori, et je regretterais beaucoup sa disparition. Ici je me

permettrai de me reporter à mon opuscule, ' Théorie de la Finance,' où il est montré, au chapitre i. que le taux de l'escompte est une entité indépendante, exigeant un symbole particulier. De plus, ses équivalents $1 - v$, $\frac{i}{1+i}$, vi, quoique numériquement identiques, ont des significations théoriques différentes ; précisément comme dans la musique, *la* dièse et *si* bémol représentent une note identique au piano ; cependant pour le musicien ils ont des significations bien différentes. Il ne peut s'élever de confusion entre d, l'escompte, et d, le nombre de décès, parce qu'ils ne se présentent jamais ensemble, et la nature de la formule montre toujours ce que l'on veut dire, sans qu'il soit possible de se tromper. Je ne doute pas qu'après les explications données par M. Bégault et par moi-même, ce point ne soit accepté.

Il résulte de ce que j'ai écrit, que, à mon avis, tous les vœux de M. Marie et aussi de ses collègues, je présume, se trouvent déjà renfermés dans la notation de l'Institute of Actuaries. Cette notation est, je pense, plus élastique et plus vaste qu'on ne l'a supposé parfois ; il n'est pas nécessaire de la limiter pour satisfaire certaines exigences spéciales. Qu'elle reste plutôt libre ; et que, dans les recherches peu courantes, où interviennent des fonctions modifiées spécialement, l'on ajoute les accents etc. nécessaires (avec des explications), pour rendre la notation exactement applicable.

Je répète qu'en adoptant la notation de l'Institute of Actuaries, ce n'est pas d'un long catalogue de symboles arbitraires qu'on fait choix, mais que l'on adhère à quelques lois générales d'application quasi-universelle. Lorsqu'il surgit des opérations nouvelles, le système de notation s'adaptera naturellement au cas ; il sera facile alors de donner au système les développements nécessaires. C'est pourquoi j'espère que la première des résolutions du Congrès de Bruxelles sera maintenant confirmée, et que la seconde, sous une forme légèrement élargie, sera adopteé.

On doit admettre qu'à certains égards, le système de notation est encore incomplet, et je citerai plus spécialement l'assurance contre la maladie. L'indemnité de maladie peut être limitée tant pour les années d'âge pour lesquelles elle est allouée, que pour la partie de la maladie qui y donne droit ; mais jusqu'à présent on n'a pas encore proposé de symboles pour designer cette différence. Je crains cependant que les actuaires de différents pays ne soient pas encore suffisamment au courant des méthodes de leurs voisins pour être à même de construire utilement une notation complète pour l'assurance contre la maladie. Au présent Congrès il a été présenté plusieurs documents de haute valeur et très intéressants, sur les sociétés de secours mutuels de différents pays ; et avec le temps, on aura accumulé une telle somme de connaissances, qu'il sera possible et utile d'étendre à l'assurance contre la maladie une notation conforme aux principes du reste de la notation de l'Institut. Je crois cependant que le moment où cette extension pourra se faire n'est pas encore venu. Je soumets à vos délibérations les résolutions suivantes :

(1) La notation de l'Institute of Actuaries sera employée de préférence par les actuaires de tous les pays.

(2) Les extensions et les perfectionnements de cette notation, qui

seront rendues désirables par le developpement toujours grandissant de la science actuarielle, seront examinées par les Congrès futurs.

(3) La notation, telle qu'elle vient d'être approuvée, sera imprimée dans les Comptes-rendus du Congrès.

Discussion and Resolutions *on a Universal Actuarial Notation.*

The President (Mr. Young) in opening the proceedings, said that the first subject to be considered was the question of a Universal Actuarial Notation, and he could not more appropriately introduce it than by expressing the great obligations under which the entire actuarial profession laboured towards M. Bégault and Mr. King, for the trouble they had taken in the elucidation and expression of a symmetrical and consistent analytical language. It was obvious how very closely thought and speech reacted upon each other. The history of mathematics had disclosed to them the fact that the progress, or decay, or arrest, of mathematical analysis had been continually due either to the invention or to the absence of an appropriate symbolism; and in England there had been no more significant feature in the history of British mathematics, than the fact that, after the death of Sir Isaac Newton, the course of mathematical analysis was retarded for nearly 100 years, simply by reason of the circumstance that British mathematicians adhered exclusively to the geometrical methods of Newton, instead of adopting the more flexible and potent instrument which lay in their power in connection with the differential calculus.

Mr. George King (London), in submitting his paper, and after summarizing it, said that, while advocating the adoption of the Notation of the Institute of Actuaries, he wished to emphasize once again that it is as yet incomplete. So far as Life Assurance and Annuity transactions are concerned, it is probably sufficient, or nearly so. But other important branches of assurance were before the Congress, such as Sickness Assurance and Accident Assurance; and for these the notation is still in a most elementary stage. For instance, in the "Text-Book", Sickness Assurance is treated in the briefest possible manner. There is but a very short chapter dealing only with the simplest functions, inserted so that the student may know that such things exist, and may have some idea of what they mean. But the very intricate questions which arise in connection with Friendly Society finance are not touched upon; and for these no notation has yet been prepared. He thought it would be very desirable, now that Sickness Assurance and Accident Assurance have become so universal, and now that so many countries are passing special legislation regarding them, to consider the question of a suitable system of notation. The papers on the position of Friendly Societies in various countries which had been submitted to the Congress, furnished a good opportunity for commencing such a study; and he hoped that before the Congress of 1900, the matter might be taken up. The question is not yet quite ripe, but he would throw out the idea whether the Permanent Committee could

not take it in hand and have some suggestions to make to the Third International Actuarial Congress. Notation on these new subjects should follow the principles of the Institute Notation, which were really applicable to all classes of benefits.

Mr. King then formally moved the three following resolutions :—

(1) That the Notation of the Institute of Actuaries shall be employed in preference by the actuaries of all countries.

(2) That such expansions and improvements thereof, as the continually extending sphere of actuarial science may render desirable, shall be considered at future Congresses.

(3) That that Notation, as now approved, be printed in the Transactions of the Congress.

In conclusion, the speaker said that he earnestly hoped there would be unanimity. In fact, were there not unanimity, there could not be a Universal Notation; because those who disagreed would go on using their own individual notation, and there was no penalty which could be imposed to prevent them from doing so. If the resolutions he submitted, or others in similar terms, were adopted, then the notation would cease to be that of the Institute of Actuaries, and would become the Congress Notation—the Universal Notation.

M. Léon Marie (France), in seconding the three resolutions, said that :—

He considered, as he had already repeated many times, the notation of the Institute of Actuaries to be a monument of actuarial science. He only made a few criticisms of quite minor importance. He was an advocate for the adoption of that notation for two reasons: first, because he found it to be good, and second, because there is no other. In France, especially, there is not, so far, any notation unanimously accepted; but each author there has employed one peculiar to himself.

M. Marie was quite prepared to accept the opinion of Messrs. King and Bégault; but, nevertheless, he thought it desirable to submit to the Congress a few remarks upon the questions raised by these two respected colleagues.

1. To represent a pure endowment, he agreed unreservedly that the symbol ${}_nE_x$ should be retained for teaching purposes; but he thought the symbol $A_{\overline{xn}|}^{\ 1}$ should alone be employed for daily use.
2. While still maintaining his own views as to the inconvenience of placing indices to the left of and below the principal symbol, yet, as Messrs. King and Bégault consider it to be impossible to dispense with them entirely, he did not press the point.
3. As to an assurance for a term

Il considère, ainsi qu'il l'a déjà répété maints fois, la notation de l'Institute of Actuaries comme un monument de la science actuarielle; il n'y a fait que quelques critiques d'ordre secondaire. Il est partisan de l'adoption de cette notation pour deux raisons: d'abord, parcequ'il la trouve bonne, et, ensuite parcequ'il n'y en a pas d'autres. En France, notamment, il n'y a pas jusqu'ici de notation unanimement admise; chaque auteur y a employé une notation purement personnelle.

M. Léon Marie est prêt à se rallier à l'opinion de MM. King et Bégault. Il croit cependant utile de soumettre au Congrès quelques observations sur les questions soulevées par ses deux excellents collègues.

1. Pour la représentation de la valeur d'un capital différé, il admet à la rigueur que l'on conserve le signe ${}_nE_x$ pour l'enseignement; mais il pense qu'il faut adopter seulement $A_{\overline{xn}|}^{\ 1}$ dans la notation courante.
2. Tout en maintenant sa manière de voir au sujet des inconvénients que présentent les symboles placés à gauche et au dessous des lettres principales, comme MM. King et Bégault jugent impossible de s'en passer complètement, il n'insiste pas.
3. Pour les assurances à terme fixe,

certain, he agreed with Messrs. King and Bégault.

4. He agreed with M. Bégault as to the notation for single and annual premiums, because, as M. Bégault says in his Paper, the whole-life assurance, for example, may be subject to temporary premiums; or the payment of premiums may depend on the life of another person than the life assured. Therefore he thought it desirable to employ two separate letters, one setting forth the nature of the assurance, and the other the mode of payment of the premiums—things essentially distinct, and almost independent of each other.
5. He considered that two special symbols were required, either G and H, or any other letters not already appropriated, to represent the paid-up policy and the surrender-value, respectively, of an assurance. He was pleased to find that his colleagues approved of adding one or two accents to the symbol for the net premium, so as to represent loaded premiums, such as the valuation premium and the office premium.
6. The question of commutation tables is only incidentally connected with the matter before the Congress, which is the representation of the various assurance benefits by appropriate symbols. If in his paper, read before the Institute of French Actuaries, he (M. Marie) had criticized the N_x column, it was because, according to the English system of notation, M_x, S_x, and R_x represent summations starting with x. There is, therefore, no logical reason to make N_x alone start with D_{x+1}. This is a source of confusion and error, and is entirely without justification, as has been recognized by Mr. King himself in his authoritative "Text-Book". The only reason adduced

il est d'accord avec MM. King et Bégault.

4. Pour la représentation des primes uniques et annuelles, il est d'accord avec M. Bégault, car, ainsi que le dit ce dernier dans son rapport, l'assurance vie entière, par exemple, peut être à primes temporaires; le payement de la prime peut aussi dépendre de la vie d'une tête autre que la tête assurée. Aussi, trouve-t-il préférable d'utiliser deux lettres distinctes, l'une exprimant la nature de l'assurance, et l'autre, les conditions du payement de la prime, choses essentiellement distinctes et presque indépendantes l'une de l'autre.
5. Il estime qu'il faut deux signes particuliers, soit G et H, soit toute autre lettre non encore utilisée, pour représenter respectivement la valeur de réduction et la valeur de rachat d'une police d'assurance.
   Il est heureux de voir ses collégues approuver la proposition d'accentuer une ou deux fois les symboles des primes pures pour leur faire représenter des primes chargées, telles que les primes d'inventaire et les primes commerciales.
6. La question des tables de commutation ne se rattache qu'accessoirement à la question examinée par le Congrès, c'est à dire à la représentation des diverses combinaisons d'assurance par des symboles appropriés. Si, dans son rapport à l'Institut des Actuaires Français, M. Léon Marie a émis une critique au sujet des N_x, c'est que dans la notation anglaise, M_x, S_x, et R_x indiquent des sommations à partir de x. Il n'y a donc pas de raison pour faire commencer N_x seul à D_{x+1}. C'est une source de confusions et d'erreurs, et ce système paraît absolument injustifiable, comme l'a reconnu M. King lui même dans son magistral "Text-Book". La seule raison fournie par les

by the defenders of the system is, that many tables exist which it would be necessary to reeast, and this they think to be impracticable. But it must first be noted that the American and the French tables are prepared on the other plan ($N_x = D_x + D_{x+1}$ + &c.). Only English tables make $N_x = D_{x+1} + D_{x+2}$ + &e. Moreover, these tables will soon become of much less importance. It is known that, in England, new mortality tables are in course of preparation, based on the stupendous experience of 63 companies. The time would, therefore, be opportune to apply to these new tables the system $N_x = D_x + D_{x+1}$ + &c.

7. He (M. Marie) did not insist on the disuse of v, but adopted the proposal to continue to use v to represent the value of unity due a year hence; provided always that r should be rejected entirely, and should be represented by v^{-1}.
8. As to the question of d, that was of quite secondary importance, and he (M. Marie) did not press it.

The notations hitherto employed by writers on assurance against infirmity and against sickness, presented many discrepancies, and do not always conform to the general principles of the notation used for life assurance. Even the notation given in the Text-Book for sickness assurance, is not very satisfactory.

Believing that it is desirable to arrive at uniformity, and hoping that the resolutions submitted to the Congress will contribute towards that end, he (M. Marie) was very pleased to second the three resolutions proposed by Mr. King, namely,

1. That the Notation of the Institute of Actuaries shall be employed in preference by the actuaries of all countries.
2. That such expansions and improvements thereof as the continually extending sphere of actuarial science may render desirable,

défenseurs du système, c'est l'existence d'un grand nombre de tables qu'il faudrait refaire, ce qui leur semble impraticable. Mais d'abord les tables américaines et françaises sont dressées d'après l'autre système ($N_x = D_x + D_{x+1} + \ldots$). Seules, les tables anglaises sont faites avec $N_x = D_{x+1} + D_{x+2} + \ldots$, Or, ces tables vont devenir beaucoup moins intéressantes, à bref délai. Comme nous le savons, on prépare actuellement, en Angleterre, de nouvelles tables de mortalité basées sur l'expérience colossale de 63 compagnies. Le moment serait donc bien choisi pour appliquer à ces nouvelles tables, le système de commutation $N_x = D_x + D_{x+1} + \ldots$

7. M. Léon Marie n'insiste pas pour la suppression de v et se rallie à la proposition de continuer à représenter par v la valeur de l'unité escomptée pour un an, à condition que r disparaisse complètement et soit représenté par v^{-1}.
8. Quant à la question de d, elle est absolument secondaire, et M. Léon Marie n'insiste pas.

Les notations employées par les auteurs qui, jusqu'à ce jour, se sont occupés de l'assurance contre l'invalidité et contre la maladie, présentent des divergences, et ne sont pas toujours conformes aux principes généraux de la notation suivie en assurance-vie. La notation donnée pour l'assurance contre la maladie par le Text-Book de l'Institute of Actuaries n'est pas elle même très satisfaisante.

Comme il est désirable d'arriver à l'uniformité, si le vœu qui est soumis au Congrès a pour effet d'y contribuer, l'orateur se rallie bien volontiers aux propositions faites par M. King, savoir :—

1. La notation de l'Institute of Actuaries sera employée de préférence par les actuaires de tous les pays.
2. Les extensions et les perfectionnements de cette notation qui seront rendus désirables par le developpement toujours gran-

shall be considered at future Congresses.

3. That that Notation, as now approved, be printed in the Transactions of the Congress.

He (M. Marie) also thought that a committee should be appointed to prepare a schedule of the notation thus adopted. He did not think it would be worth while to publish in the Transactions of the Congress, the whole of the Notation of the Institute of Actuaries. It would be better to limit it to the most important symbols, those, in fact, which are essential; and to omit those relating to such benefits as are not of universal interest, and those relating to benefits of an entirely exceptional nature.

dissant de la science actuarielle seront examinés par les Congrès futurs.

3. La notation, telle qu'elle vient d'être approuvée, sera imprimée dans les Comptes-rendus du Congrès.

L'orateur pense aussi qu'un comité doit être chargé de dresser le tableau de la notation adoptée. Il ne croit pas qu'il soit bien utile de publier dans les comptes rendus du Congrès l'ensemble de la notation de l'Institute of Actuaries. Il voudrait que l'on se bornât aux symboles principaux et pour ainsi dire essentiels, en laissant de côté les symboles propres à certaines opérations qui n'offrent pas un caractère universel et ceux qui concernent des opérations tout à fait exceptionnelles.

Dr. Sprague, (Edinburgh), said he thought the members of the Congress would probably be aware that the subject under discussion was one to which in former years he had given a great deal of thought and attention. Without being at all vain, he thought he might claim the merit of having been the first to move seriously in the matter. It was a great many years since he brought the subject before the notice of the Institute of Actuaries, when it was taken up in earnest, and a general meeting, not of the Institute of Actuaries, but of London actuaries, was held under the presidency of Mr. Frederick Hendriks, who, he was pleased to see, was still vigorous and a member of the Congress. Since that time, he (Dr. Sprague) had in a manner left the subject alone. But Mr. King had taken it up and elaborated it as it appeared in the Institute Text-Book. Mr King had introduced some changes and extensions, and now it was proposed by their French friends that the notation should be further considered and probably some slight new changes introduced. That had revived his interest in the subject, and he had carefully considered the remarks of M. Bégault and M. Marie, and he was very pleased to find himself very much in agreement with these gentlemen, and especially with M. Bégault. Dr. Sprague mentioned as very satisfactory that, as a result of a small meeting held that morning, the French and the English actuaries had come, he thought, to a perfect agreement. He did not think there could be any hesitation in accepting M. Marie's suggestion, that in a universal notation those symbols should be omitted which were peculiar to a single nation. The doctrine of advowsons and successive lives seemed to be pretty well peculiar to England. Being of no interest to foreign actuaries, he thought the symbols relating to those branches might be left out. On the other hand, he would point out to M. Marie that, although the French had what they called valuation premiums—a term with which he (Dr. Sprague) was not familiar before that morning, but which M. Bégault had been kind enough to explain to him—in Great Britain there was no such thing. There were net premiums and loaded premiums, but not valuation premiums. Therefore he thought no mention should be made of valuation premiums in the universal notation. He thought there was a great deal of force in what M. Marie had said, that the symbol P should have no significance in itself, but should be prefixed to the symbol for the single premium for a benefit, in order to denote the annual premium for that benefit. But he thought that by analogy from other branches of science—pure mathematics for instance—there would be justification for using P, without the A which indicates the assurance, so that P, with a suffix denoting the age, might signify the annual premium for a whole-life assurance.

With regard to the initial and the terminal forms of the N column, he thought it was very unfortunate that such diversity of practice should have arisen. In England, one form only should be used, but even in England that rule had not always been adhered to, and valuable tables had been published, both in England and in Scotland, in which the initial form had been employed. Looking back on this, and seeing the general adoption of the initial form in other countries, he (Dr. Sprague) thought that it had been a mistake on the part of the Institute of Actuaries not to have abandoned the terminal form a generation ago. But now we must take things as we find them, and we have to consider the large number of tables that have been printed, some in one form and some in the other. It would be very desirable if we could get rid of such diversity, and a step towards that consummation would be to adopt a universal notation.

Mr. C. D. Higham, (London), wished to mention only one small point. He was very glad to hear Mr. King pleading strenuously for the retention of *d* as representing the discount, and he had always regretted that that symbol had been omitted from the scheme of Institute Notation as first published.

Dr. Moser, (Switzerland), was in favour of a universal notation, but thought it should not be confined to life assurance, but should be extended to assurance against infirmity, and sickness, and old age. He thought a committee should be appointed to study this question of extension, or that the question might be referred to the Permanent Committee for report to the next Congress.

Mr. Israel C. Pierson, (America), on behalf of the American Actuaries, said they entirely approved of the resolutions as presented by Mr. King. They coincided with the remarks which had been made by Mr. King and M. Bégault in their Papers. The initial form of N was, of course, a matter of importance to American actuaries on account of the very numerous formulas that were used in their more than 700 varieties of policy contract, but they were entirely content with the suggestions that had been made for distinguishing the initial from the terminal form of N.

The President said that the proposal of Dr. Moser would come as a natural corollary to the resolutions proposed by Mr. King and seconded by M. Marie. He would, therefore, first put these resolutions, and then ask Dr. Moser formally to submit his proposition to refer to the Permanent Committee the question of the extension of the notation to assurance against sickness and old age.

The propositions before the Congress, it would be observed, he added, accepted the principle of the system of notation, but possessed the elasticity of form which would enable subsequent investigators, as their province of work enlarged, to adopt a sequence of symbols in harmony with the chief notation.

The three resolutions of Mr. King were then put to the Congress, and carried by acclamation.

On the motion of the President, the following were appointed a Committee to prepare a schedule of the notation for the Transactions of the Congress, namely:—M. Bégault, Dr. Karup, Mr. King, M. Marie, and Dr. Sprague.

On the invitation of the President, Dr. Moser moved:—

> That a Universal Notation be adopted, not only for Life Assurance, but for all other branches of assurance; and that the matter be referred to the Permanent Committee for consideration and report to the next International Actuarial Congress.

This resolution having been seconded by Mr. King, was put to the Congress by the President, and carried unanimously.

THE UNIVERSAL NOTATION.

Explanatory Statement of the Principles underlying the System of Universal Notation for Life Contingencies, adopted unanimously by the Second International Actuarial Congress on May 19, 1898. *Prepared by the Committee, (consisting of* M. Am. Bégault, *Brussels;* Dr. J. Karup, *Gotha;* Mr. George King, *London;* M. Léon Marie, *Paris; and* Dr. T. B. Sprague, *Edinburgh), appointed for that purpose.*

The Universal Notation, as embodied in the following Statement, has been taken, almost as it stands, from the "Key to the Notation" given in the *Institute of Actuaries Text-Book*, Part II, *Life Contingencies*. The simple principles on which the system is based are explained, and sufficient examples are given to make the application of these principles clear. Those portions of the Notation of the *Text-Book* have been omitted which are not of an International character, and, in accordance with a wish expressed by several at the Congress, emphasis has been laid on the advantages, in many cases, of using the symbols P, V, and W, in conjunction with other symbols, instead of alone; although, to meet the views strongly held by others, the option has been retained of employing these letters by themselves in simple cases, where confusion could not thereby be caused. Similarly, attention has been specially called to the use of accents affecting such symbols as P, V, &c., to denote office premiums, valuation premiums, &c., and the corresponding values of other functions.

The only changes that have been introduced into the Notation of the *Text-Book* are, to substitute the hitherto unappropriated letter W for (FP), to represent the Paid-up Policy, such a change having been urged by more than one speaker at the Congress; and to limit q, the probability of death, to a term of one year, Q being employed for longer terms.

The Notation for *Selection* is that which was officially adopted by the Institute of Actuaries of London for its two publications, *Select Life Tables* and *Joint Life Annuity Tables*.

OF THE UNIVERSITY OF CALIFORNIA

Interest :—

i = the effective rate of interest, namely, the interest actually realised on 1 in one year.

$j_{(m)} = m\{(1+i)^{\frac{1}{m}}-1\}$ = the nominal rate of interest, convertible m times in a year, when the effective rate is i.

$i^{(m)}$ = the effective rate of interest, when interest is convertible m times in a year.

$\bar{\imath} = i^{(\infty)}$ = the effective rate of interest when interest is convertible momently.

$v = (1+i)^{-1}$ = the present value of 1 due a year hence.

$d = 1-v$ = the discount on 1 due a year hence.

$\delta = j_{(\infty)} = \log_e(1+i) = -\log_e(1-d)$ = the force of interest or the force of discount.

$a_{\overline{n}|} = v+v^2+v^3+\&c.+v^n$ = the value of an annuity for n years certain.

$s_{\overline{n}|} = 1+(1+i)+(1+i)^2+\&c.+(1+i)^{n-1}$ = the amount of an annuity for n years certain.

Mortality Tables :—

A letter enclosed in brackets, thus (x), denotes "a person aged x."

For each class of functions a principal letter is used, and its meaning in any particular case is defined by suffixes, &c., as circumstances may require.

We have

l = Number living.
d = Number dying.
L = Population.
p = Probability of living.
q, Q = Probability of dying, q being used for a term limited to one year, and Q for a longer term.
μ = Force of mortality.
m = Central death-rate.
e = Expectation of life.
E = Endowment.
a = Annuity, first payment to be made at the end of one period of payment.
$\mathbf{a}$ = Annuity, first payment to be made at once.
A = Assurance, or Single Premium.
V = Policy Value.
W = Paid-up Policy.*

P, π = Premium per annum, where P refers generally to net premiums, and π to special premiums, for instance, premiums for assurances with return of premiums.

The ages of the lives involved are denoted by letters placed as suffixes at the lower right corner of the principal symbol; and if two

* In the *Text-Book of the Institute of Actuaries* this is denoted by (FP).

or more letters in a suffix are not distinguished by any special mark, joint lives are intended. Thus,

l_x = Number living at age x according to the Mortality Table.
d_x = Number dying between the ages x and $x+1$.
p_x = Probability that (x) will live one year.
q_x = Probability that (x) will die within the year.
m_x = "Central death rate" for the year x to $x+1$, $=\mu_{x+\frac{1}{2}}$ approximately.
a_x = Annuity, first payment at the end of a year, to continue during the life of (x).
$\mathbf{a}_x$ = A similar annuity, first payment, however, to be made at once.
a_{xyz} = Annuity, first payment at the end of a year, to continue during the joint lives of (x), (y), and (z).
A_x = Assurance payable at the end of the year of the death of (x).
A_{xyz} = Assurance payable at the end of the year of the failure of the joint lives, (x), (y), and (z).

If one of the letters in the suffix is enclosed in a right angle, the symbol denotes a term-certain, and not the age of a life. Thus,

$a_{x\overline{n}|}$ = Annuity to continue during the joint duration of the life of (x) and a term of n years certain; that is, a temporary annuity for n years on the life of (x).
$\mathrm{A}_{x\overline{n}|}$ = Assurance payable at the end of the year of the death of (x) if he die within n years, or at the end of n years if (x) be then alive; that is, an endowment assurance for n years.

The suffix may consist only of a letter enclosed in a right angle, in which case a term-certain only is indicated. Thus,

$a_{\overline{n}|}$ = Annuity for n years certain.
$\mathrm{A}_{\overline{n}|}$ = v^n = Assurance payable at the end of n years certain.

If a perpendicular bar separates the letters in the suffix, then the status after the bar is to follow the status before the bar. Thus,

$a_{y|x}$ = Annuity on the life of (x) after the death of (y).
$\mathrm{A}_{z|xy}$ = Assurance payable on the failure of the joint lives (x) and (y) provided these lives both survive (z).

If a horizontal bar appears above the suffix, then survivors of the lives, and not joint lives, are intended. The number of survivors is denoted by a letter or number over the right end of the bar. If that letter, say r, is not distinguished by any mark, then the meaning is, *at least* r survivors; but if it is enclosed in square brackets, $[r]$, then the meaning is *exactly* r survivors. If no letter appears over the bar, then unity is supposed, and the meaning is *at least one* survivor. Thus,

$e_{\overline{xyz\ldots(m)}}^{\ r}$ = Expectation of life of the m lives and the last r survivors of them.
$p_{\overline{xyz\ldots(m)}}^{\ [r]}$ = Probability that exactly r lives out of m lives will survive a year.
$a_{\overline{xyz}}$ = Annuity on the last survivor of (x), (y), and (z).

When numerals are placed above or below the letters of the suffix, they designate the order in which the lives are to fail. The numeral placed *over* the suffix points out the life whose failure will finally determine the event; and the numerals placed *under* the suffix indicate the order in which the other lives involved are to fail. Thus,

$$\left.\begin{matrix}{}^{1}Q_{xyz}\\ {}^{2}Q_{xyz}\\ {}^{3}Q_{xyz}\end{matrix}\right\} = \text{Total probability that } (x) \text{ will die } \begin{cases}\text{first} & \text{of the three lives.}\\ \text{second} & \text{,,} \quad \text{,,}\\ \text{third} & \text{,,} \quad \text{,,}\end{cases}$$

$A^{4}_{\substack{wxyz\\321}}$ = Assurance payable at the end of the year of the death of (w) if he die last of the four lives, the other lives having failed in the order (z) first, (y) second, and (x) third.

$$\left.\begin{matrix}a_{\overline{yz}|x}\\ {}^{2}a_{yz|x}\end{matrix}\right\} = \begin{cases}\text{Annuity to } (x) \text{ after the failure of the survivor of } (y)\\ \text{and } (z), \text{ provided } (z) \text{ fail before } (y).\end{cases}$$

or

$A_{\overline{xy}:\underset{3}{z}}$ = Assurance payable at the end of the year of the death of the survivor of (x) and (y) if he die before (z).

When, for the sake of distinctness in the symbol, it is desired to separate the letters in the suffix, a colon is placed between them. A colon is used instead of a point or comma, so as not to confuse with decimals when numbers take the place of letters. Thus, we write $a_{x+n:y+n}$, and $A_{35:40}$.

A letter at the lower left corner of the principal symbol denotes the number of years involved in the probability or benefit in question. Thus,

${}_{n}p_{x}$ = Probability that (x) will live n years.
${}_{n}E_{x}$ = Value of endowment on (x), payable if he survive n years.

If the letter comes before a perpendicular bar, it shows that a deferred period is meant; while if the letter comes after a perpendicular bar, it shows that a temporary period is meant. Thus,

${}_{n|}q_{x}$ = Probability that (x) will die in a year, deferred n years; that is, that he will die in the $(n+1)$th year.
${}_{n}Q_{x}$ = Probability that (x) will die within n years.
${}_{n|}a_{x}$ = $a_{\overline{n}|x}$ = Annuity on (x) deferred n years; that is, the first payment to be made at the end of $(n+1)$ years.
$|_{n}a_{x}$ = $a_{x\overline{n}|}$ = Temporary annuity on (x) for n years.
${}_{t|n}a_{x}$ = Intercepted annuity, that is, an annuity on (x), deferred t years, and after that to run for n years.

A letter in brackets at the *upper right* corner of the principal symbol shows the number of intervals into which the year is to be divided. Thus,

$a^{(m)}$ = Annuity payable by m instalments of $\frac{1}{m}$ each throughout the year.

$A_{x}^{(m)}$ = Assurance payable at the end of that fraction $\frac{1}{m}$ of a year in which (x) dies.

If the year be divided into an infinite number of infinitesimal parts, that is, if m become indefinitely great, then, instead of writing (∞), a bar is placed over the principal symbol. Thus,

$\bar{a}$ = Continuous or momently annuity.
$\bar{\mathrm{A}}$ = Assurance payable at the moment of death.

A small circle placed over the principal symbol shows that the benefit is to be complete. Thus,

$\mathring{e}$ = Complete expectation of life.
$\mathring{a}$ = Complete annuity.

In the case of Reversionary Annuities, distinction has sometimes to be made between those where the times of year at which payments are to take place, are determined at the outset; and those where the times depend on the moment of failure of the preceding status. Thus,

$a_{y\,x}$ = Annuity to (x), first payment at the end of the year of the death of (y), or, on the average, six months after his death.
$\hat{a}_{y|x}$ = Annuity to (x), first payment one year after the death of (y).
$\mathring{\hat{a}}_{y|x}$ = Complete annuity to (x), first payment one year after the death of (y).

The symbols P for Premium, V for Policy-Value, and W for Free or Paid-up Policy, are usually to be employed in conjunction with the other symbol denoting the benefit. Thus,

$\mathrm{P}(\mathrm{A}^1_{xy})$ = The annual premium for a contingent assurance on (x) against (y).
${}_t\mathrm{V}(\mathrm{A}_{x\bar{n}|})$ = Value after t years of an endowment assurance on (x).
${}_t\mathrm{W}(\mathrm{A}_x)$ = Paid-up Policy after t years which is the equivalent of an ordinary policy on (x) that has been t years in force.

Suffixes, &c., showing the conditions of the benefit, are to be attached to the principal letter, and suffixes, &c., showing the conditions of payment of the premium, are to be attached to the subsidiary symbol P. Thus,

${}_n\mathrm{P}(\bar{\mathrm{A}}_x)$ = Annual premium, payable for n years only, for an assurance payable at the moment of the death of (x).
$\mathrm{P}_{xy}(\mathrm{A}_x)$ = Annual premium, payable during the joint lives of (x) and (y), for an assurance payable at the end of the year of the death of (x).
${}_t\mathrm{P}^{(m)}(\mathrm{A}_{x\bar{n}|})$ = Premium per annum for t years only, payable by m instalments throughout the year, for an endowment assurance for n years on (x).

It is permissible, however, in simple cases where no confusion can arise, to employ the letters P, V, and W as symbols by themselves. Thus, we may write P^1_{xy} for $\mathrm{P}(\mathrm{A}^1_{xy})$; ${}_t\mathrm{V}_{x\bar{n}|}$ for ${}_t\mathrm{V}(\mathrm{A}_{x\bar{n}|})$; and ${}_t\mathrm{W}_x$ for ${}_t\mathrm{W}(\mathrm{A}_x)$.

In particular investigations, where modified values of functions are in question, such modification may be denoted by adding accents

to the symbols. Thus, where a premium other than the net premium (a valuation premium) is used in a valuation, it may be denoted by P′; and the corresponding policy-value may be denoted by V′. Similarly, the "office" or "commercial" premium may be denoted by P″, and the surrender-value of a policy by V″, and the "office" paid-up policy by W″.

The following compound symbols are used:

(Ia) = Annuity { commencing at 1, and
(IA) = Assurance { increasing 1 per annum.
(va) = Varying annuity.
(vA) = Varying assurance.

If the whole benefit is to be temporary, the symbol of limitation is placed outside the brackets. Thus.

$(Ia)_{x\overline{n}|}$ = Temporary increasing annuity.
$(IA)^{1}_{x\overline{n}|}$ = „ „ assurance.
$(va)_{x\overline{n}|}$ = „ varying annuity.
$(vA)^{1}_{x\overline{n}|}$ = „ „ assurance.

If only the increase or the variation is to be temporary, but the benefit to be for the whole of life, then the symbol of limitation is placed immediately after the symbol I or v. Thus,

$(I_{\overline{n}|}a)_x$ = Whole-life annuity
$(I_{\overline{n}|}A)_x$ = „ assurance } increasing for n years.
$(v_{\overline{n}|}a)_x$ = „ annuity
$(v_{\overline{n}|}A)_x$ = „ assurance } varying for n years.

Commutation Columns:—

$$\begin{aligned}
D_x &= v^x l_x.\\
N_x &= D_{x+1}+D_{x+2}+D_{x+3}+\&c.\\
\mathbb{N}_x \Big\} &= D_x+D_{x+1}+D_{x+2}+\&c.\\
x \Big\} &\\
S_x &= N_x+N_{x+1}+N_{x+2}+\&c.\\
C_x &= v^{x+1}d_x.\\
M_x &= C_x+C_{x+1}+C_{x+2}+\&c.\\
R_x &= M_x+M_{x+1}+M_{x+2}+\&c.
\end{aligned}$$

or

When it is desired to construct the assurance columns so as to give directly assurances payable at the moment of death, the symbols are distinguished by a bar placed over them. Thus,

$$\begin{aligned}
\overline{C}_x &= v^{x+\frac{1}{2}}d_x, \text{ approximately.}\\
\overline{M}_x &= \overline{C}_x+\overline{C}_{x+1}+\overline{C}_{x+2}+\&c.\\
\overline{R}_x &= \overline{M}_x+\overline{M}_{x+1}+\overline{M}_{x+2}+\&c.
\end{aligned}$$

Joint Lives:—

$$\begin{aligned}
D_{xy} &= v^{\frac{x+y}{2}} l_x l_y\\
N_{xy} &= D_{x+1:y+1}+D_{x+2:y+2}+D_{x+3:y+3}+\&c.\\
C_{xy} &= v^{\frac{x+y}{2}+1}(l_x l_y - l_{x+1}l_{y+1})\\
M_{xy} &= C_{xy}+C_{x+1:y+1}+C_{x+2:y+2}+\&c.\\
C^1_{xy} &= v^{\frac{x+y}{2}+1} d_x l_{y+\frac{1}{2}}\\
M^1_{xy} &= C^1_{xy}+C^{\frac{1}{2}}_{x+1:y+1}+C^{\frac{1}{2}}_{x+2:y+2}+\&c.
\end{aligned}$$

Selection :—

Square brackets in the suffix to a symbol denote the age at which the life was selected. Any additional term in the suffix, not enclosed in square brackets, denotes the number of years which have elapsed since selection. The total suffix, therefore, denotes, as usual, the present age of the life. Thus,

$a_{[x]}$ = value of an annuity on a life now aged x and now select.
$a_{[x]+n}$ = value of an annuity on a life now aged $x+n$, and select n years ago at age x.
$a_{[x-n]+n}$ = value of an annuity on a life now aged x, and select n years ago at age $x-n$.

Similarly for other functions.

Notes :—

Dr. Sprague, while approving in general of the list of Symbols and Functions tabulated above, and therefore accepting this Schedule, thinks that the arrangement and explanations might be improved, and that some additional Symbols might, with advantage, be included. He therefore proposes to prepare a Paper on the subject, and submit it to the Paris Congress of 1900.

Dr. Sprague and Mr. King consider that P, V, and W, should be used alone, and not in combination with other Symbols (such as A or a), except in the case of complicated benefits where confusion might otherwise arise.

Dr. Karup desires to point out that he considers the Symbols $i^{(m)}$ and $\bar{\imath}$ to be superfluous, as i, $j_{(m)}$ and δ sufficed to express all the relations between the effective and the nominal rates of interest. For from the definition of $j_{(m)}$ it follows that $i=\left(1+\frac{j_{(m)}}{m}\right)^m-1$, and therefore that $i^{(m)}$ and i are in fact identical. And similarly it follows, from the definition of δ, that $i=e^{\delta}-1=e^{j_{(m)}}-1$, so that $\bar{\imath}$ and i are also identical.

LA NOTATION UNIVERSELLE.

Exposé des principes sur lesquels repose le système de notation universelle pour les opérations viagères, adopté à l'unanimité le 19 *mai* 1898 *par le deuxiéme Congrès International d'Actuaires. Présenté par la Commission nommée à cet effet* (*comprenant* M. Am. Bégault, *Bruxelles;* Dr. J. Karup, *Gotha;* M. George King, *Londres;* M. Léon Marie, *Paris; et* Dr. T. B. Sprague, *Edinbourg*).

La notation universelle, qui est exposée ci-après, est extraite presque tout entière de la "Clef de la Notation" donnée dans le "Text-Book de l'Institut des Actuaires" deuxième partie, Opérations viagéres. Les principes simples sur lesquels le système est basé y sont expliqués et il y est donné suffisamment d'exemples pour que l'application de ces principes soit aisée. On a laissé de côté les parties de la notation qui n'ont pas un caractère international, et, d'accord avec le vœu exprimé par plusieurs membres du Congrès, on a considéré comme important de permettre, dans certains cas, d'employer les symboles P, V, et W, réunis à d'autres symboles, au lieu de les employer seuls. Cependant, pour satisfaire aux désirs exprimés par d'autres membres, on a maintenu la faculté d'employer ces lettres seules, lorsqu' aucune confusion ne peut résulter de cet emploi. On a de même tout spécialement appelé l'attention sur l'usage des accents affectés aux symboles P, V, etc. . . , pour représenter les primes commerciales, les primes d'inventaire, etc. . . , et les valeurs correspondantes des autres fonctions.

Les seuls changements qui ont été introduits dans la notation du Text-Book consistent dans la substitution de la lettre W, jusqu' ici sans emploi, à (FP) your représenter la police libérée, cette modification ayant été réclamée au Congrès par plusieurs orateurs, et dans l'emploi de q limité à la représentation de la probabilité de décès dans l'espace d'une année, Q étant réservé pour les durées plus longues.

La notation pour la Sélection est celle qui a été adoptée officiellement par l'Institut des Actuaires de Londres pour les deux ouvrages

qu'il a publiés: "Select Life Tables" et "Joint Life Annuity Tables." *

Intérêt :—

i = taux réel d'intérêt, c'est-à-dire l'intérêt sur un capital 1 réellement obtenu en un an.

$j_{(m)} = m\{(1+i)^{\frac{1}{m}}-1\}$ = taux annuel proportionnel au taux équivalent au taux annuel i, lorsque la capitalisation se fait m fois par an.

$i^{(m)}$ = taux réel d'intérêt, lorsque la capitalisation se fait m fois par an.

$\bar{\imath} = i^{(\infty)}$ = taux réel d'intérêt lorsque la capitalisation est continue.

$v = (1+i)^{-1}$ = valeur actuelle de 1 payable dans un an.

$d = 1-v$ = l'escompte sur un capital 1 payable dans un an.

$\delta = j_{(\infty)} = \log_e(1+i) = -\log_e(1-d)$ = taux instantané d'intérêt (force d'intérêt, ou force d'escompte).

$a_{\overline{n}|} = v+v^2+v^3+\text{etc.}+v^n$ = la valeur actuelle de n annuités certaines.

$s_{\overline{n}} = 1+(1+i)+(1+i)^2+\text{etc.}+(1+i)^{n-1}$ = la valeur acquise à la fin de n années par n annuités payables en fin d' année.

Tables de mortalité :—

Une lettre enfermée entre parenthèses, comme (x), désigne "une personne d'âge x."

On emploie pour chaque classe de fonctions une lettre principale; on en modifie la signification par des indices, etc., suivant le cas.

On a:

l = Nombre de vivants.

d = Nombre de décès.

L = Population.

p = Probabilité de vie.

q, Q = Probabilité de décès, q servant pour la probabilité limitée à un an, et Q pour les durées plus longues.

μ = Force (taux instantané) de mortalité.

m = Taux central de décés.

e = Espérance de vie.

E = Capital différé.

a = Annuité, ou rente viagère, le premier paiement devant se faire à la fin du premier intervalle.

a = Annuité, ou rente viagère, le premier paiement devant être fait de suite.

A = Assurance, ou prime unique d'Assurance.

V = Valeur d'une police.

W = Police libérée. †

P, π = Prime annuelle où P se rapporte en général aux primes pures ordinaires et π à des primes spéciales, telles que les assurances avec remboursement des primes.

* "Tables de mortalité d'après l'âge à l'entrée" et "Tables d'annuités sur plusieurs têtes réunies."

† Dans le Text-Book de l'Institut des Actuaires cette valeur est représentée par (FP).

Les âges des têtes considérées sont indiqués par des lettres placées en indice à droite du symbole principal et un peu plus bas; lorsque les lettres de l'indice n'ont aucun signe spécial, il s'agit de têtes groupées. Ainsi,

l_x = Nombre de vivants à l'âge x d'aprés la table de mortalité.
d_x = Nombre de décès se produisant entre les âges x et $x+1$.
p_x = Probabilité qu'a une tête (x) de vivre un an.
q_x = Probabilité qu'a une tête (x) de mourir dans le cours de l'année.
m_x = "Taux central de décès" de l'âge x à l'âge $x+1 = \mu_{x+\frac{1}{2}}$ approximativement.
a_x = Valeur actuelle d'une annuité dont le premier paiement se fera dans un an, et qui continuera pendant toute la vie de (x).
$\mathbf{a}_x$ = Valeur actuelle de la même annuité mais dont le premier paiement doit se faire immédiatement.
a_{xyz} = Valeur actuelle d'une annuité dont le premier paiement doit se faire dans un an, et qui continuera tant que le groupe formé par les têtes (x), (y), et (z) existera.
A_x = Assurance payable à la fin de l'année où (x) mourra.
A_{xyz} = Assurance payable à la fin de l'année où le groupe formé par les trois têtes (x), (y), (z) cessera d'exister (*c, a, d,* Assurance payable au premier décès qui se produira parmi les trois têtes (x), (y), (z).

Si l'une des lettres de l'indice est renfermée dans un angle droit, elle représente un nombre certain d'années et non l'âge d'une tête. Par exemple:

$a_{x\overline{n}|}$ = Valeur actuelle d'une annuité qui se payera pendant la durée commune de la vie d'une personne âgée de x années et d'une période fixe de n années; c'est-à-dire annuité temporaire reposant sur la tête de (x).
$\mathrm{A}_{x\overline{n}|}$ = Assurance payable à la fin de l'année ou se produira le décès de (x), si ce décès survient avant n années, ou à la fin de n années si (x) est encore en vie, c'est-à-dire une assurance mixte.

L'indice peut consister seulement enu ne lettre renfermée dans un angle droit. Dans ce cas il indique seulement un nombre certain d'années. Par exemple:

$a_{\overline{n}|}$ = Valeur actuelle de n annuités certaines.
$\mathrm{A}_{\overline{n}|}$ = v^n = Assurance payable certainement dans n années (Assurance à terme fixe).

Si les lettres de l'indice sont séparées par une barre verticale, cela signifie que le status qui suit la barre doit être postérieur à celui qui la précède. Ainsi:

$a_{y|x}$ = Valeur d'une annuité à payer à une personne d'âge (x) à partir du décès d'une personne d'âge (y).
$\mathrm{A}_{z|xy}$ = Valeur d'une assurance à payer lors de la dissolution du groupe formé par les têtes (x) et (y), pourvu que ce groupe survive à la tête (z).

Si l'indice est surmonté d'une barre horizontale, il s'agit des survivants des têtes considérées et non des têtes réunies. Le nombre des survivants est indiqué par une lettre ou un nombre placé au-dessus de l'extrémité droite de la barre. Si cette lettre, que nous appellerons r, par exemple, n'a pas de signe spécial, elle signifie *au moins* r survivants; mais si elle est renfermée entre crochets, $[r]$, elle signifie *exactement* r survivants.

S'il n'y a pas de lettre au-dessus de la barre, on y suppose l'unité et cela signifie *le dernier* survivant. Ainsi:

$e_{\overline{xyz\ldots.(m)}}^{\quad r}$ = Espérance de vie des r derniers survivants de m individus.

$p_{xyz\ldots.(m)}^{\quad [r]}$ = Probabilité que r têtes, ni plus ni moins, prises parmi m têtes données, vivront encore une années.

$a_{\overline{xyz}}$ = Valeur d'une annuité payable jusqu'au dernier décès des trois têtes (x), (y), et (z).

Quand il y a des chiffres placés au-dessus ou au-dessous des lettres de l'indice, ils indiquent l'ordre dans lequel les têtes doivent succomber. Le chiffre placé au-dessus de l'indice indique la tête dont la disparition sera la dernière condition attendue; et les chiffres placés au-dessous de l'indice indiquent l'ordre dans lequel les autres têtes en cause doivent succomber. Ainsi:

$\left.\begin{matrix} Q_{xyz}^{1} \\ Q_{xyz}^{2} \\ Q_{xyz}^{3} \end{matrix}\right\}$ = Probabilité totale que $\begin{cases} \text{la première des trois têtes.} \\ \text{la seconde des trois têtes.} \\ \text{la troisème des trois têtes.} \end{cases}$ (x) mourra

$A_{wxyz\ 321}^{\ 4}$ = Valeur d'une assurance payable au décès de (w) s'il meurt le dernier des quatre, les autres têtes ayant succombé dans l'ordre suivant: (z) le premier, (y) le second, et (x) le troisième.

ou $\left.\begin{matrix} a_{\overline{yz}|x} \\ a_{yz|x}^{\ 1}{}^{2} \end{matrix}\right\} = \begin{cases} \text{Valeur d'une annuité à payer à } (x) \text{ après la disparition} \\ \text{du survivant des deux autres têtes } (y) \text{ et } (z), \text{ pourvu} \\ \text{que } (z) \text{ meure avant } (y). \end{cases}$

$A_{\overline{xy:z}\ 3}^{\ 1}$ = Valeur d'une assurance payable au décès du survivant de (x) et de (y), s'il meurt avant (z).

Lorsque, pour cause de clarté dans le symbole, on désire séparer les lettres de l'indice, on place deux points entre elles. On se sert de deux points au lieu d'un point ou d'une virgule, pour ne pas confondre avec le symbole décimal lorsqu'on remplace les lettres par des nombres. Ainsi, on écrit $a_{x+n:y+n}$, et $A_{35:40}$, etc. . . .

Une lettre mise à gauche et plus bas que le symbole principal se rapporte au nombre d'années pendant lequel on considère la probabilité ou l'opération dont il s'agit. Ainsi:

${}_{n}p_{x}$ = Probabilité qu'a (x) de vivre n années.

${}_{n}E_{x}$ = Valeur d'un capital différé payable si (x) est vivant dans n années.

Si la lettre précède une barre verticale, cela montre qu'il s'agit d'une période différée; tandis que si la lettre vient après la barre verticale, cela signifie qu'il s'agit d'une période temporaire. Ainsi:

${}_{n|}q_x$ = Probabilité que (x) mourra dans le courant d'une année différée de n années, c'est-à-dire dans le cours de la $(n+1)^{\text{ème}}$ année.

${}_{|n}Q_x$ = Probabilité que (x) mourra d'ici n années.

${}_{n|}a_x$ = Valeur d'une annuité sur la tête (x) différée de n années, c'est-à-dire dont le premier payement se fera à la fin de la $(n+1)^{\text{ème}}$ année à partir de ce jour.

${}_{|n}a_x$ = Valeur d'une annuité reposant sur (x) mais temporaire pour n années.

${}_{t|n}a_x$ = Annuité interceptée, c'est-à-dire une annuité reposant sur (x), différée et de t années, après lesquelles elle durer a n années.

Une lettre entre parenthèses placée à droite et plus haut que le symbole principal indique en combien de parties il faut diviser l'année. Ainsi:

$a^{(m)}$ = Valeur d'une annuité payable en m versements, de $\frac{1}{m}$ chacun, effectués pendant l'année.

$A_x^{(m)}$ = Valeur d'une assurance payable à la fin de la partie $\frac{1}{m}$ de l'année pendant laquelle (x) mourra.

Si l'année est divisée en un nombre infiniment grand de parties infiniment petites, c'est-à-dire, si m devient infiniment grand, on place une barre au-dessus du symbole principal au lieu d'écrire (∞). Ainsi:

$\bar{a}$ = Valeur d'une annuité continue.

$\bar{A}$ = Valeur d'une assurance payable au moment du décès.

Un petit cercle placé au-dessus du symbole principal indique que la quantité à calculer doit être complète. Ainsi:

$\mathring{e}$ = Espérance complète de vie (vie moyenne).

$\mathring{a}$ = Valeur d'une annuité complète (c'est-à-dire devant être payée jusqu'au jour du décès).

Dans le cas des annuités (rentes) de survie, il faut distinguer celles où l'époque de l'année à laquelle doit s'effecteur le payement est fixée dès le début, de celles où cette époque dépend du moment de la rupture du status précédent. On écrit donc :

$a_{y|x}$ = Valeur d'une annuité payable à (x), le premier payement devant se faire à la fin de l'année de la mort de (y), ou en moyenne, six mois après sa mort.

$\hat{a}_{y|x}$ = Valeur d'une annuité payable à (x), le premier paiement devant se faire un an après la mort de (y).

$\mathring{\hat{a}}_{y|x}$ = Valeur d'une annuité complète payable à (x) jusqu' au jour de son décès, le premier paiement devant se faire un an après la mort de (y).

Les symboles P pour Prime, V pour Valeur d'une police, et W pour Police libérée, sont ordinairement employés juxtaposés aux autres symboles représentant l'opération. Ainsi :

$P(A^1_{xy})$ = Prime annuelle d'une assurance de survie, lors du décès de (x), si (y) est encore en vie.

${}_tV(A_{x\overline{n}|})$ = Réserve après t années d'une assurance mixte d'une durée de n années reposant sur la tête de (x)

${}_tW(A_x)$ = Valeur de réduction après t années d'une assurance pour la vie entière reposant sur la tête de (x).

Les indices, etc. . . . se rapportant à l'opération doivent être disposés autour de la lettre principale et les indices, etc. . . . indiquant les conditions du payement de la prime doivent être groupés autour du symbole auxiliaire P. Par exemple :

${}_nP(\overline{A}_x)$ = Prime annuelle, payable pendant n années, d'une assurance payable au moment du décès de la tête (x).

$P_{xy}(A_x)$ = Prime annuelle payable pendant la vie commune de (x) et de (y), d'une assurance payable à la fin de l'année du décès de (x).

${}_tP^{(m)}(A_{x\overline{n}|})$ = Prime annuelle payable pendant t années, en m versements égaux effectués à intervalles égaux pendant l'année, d'une assurance mixte de n années sur la tête de (x).

Il est permis cependant, dans les cas simples où aucune confusion ne peut en résulter, d'employer seules comme des symboles les lettres P, V, et W. Ainsi l'on peut écrire P^1_{xy} pour $P(A^1_{xy})$; ${}_tV_{x\overline{n}|}$ pour ${}_tV(A_{x\overline{n}|})$ et ${}_tW_x$ pour ${}_tW(A_x)$.

Dans des recherches spéciales, lorsqu'il est question de valeurs modifiées des fonctions, ces modifications peuvent être indiquées par l'addition d'accents aux symboles.

Ainsi, lorsqu'on emploie une autre prime que la prime pure pour le calcul des réserves (prime d'inventaire), on peut la représenter par P', et la valeur correspondante de la police par V'. De même, les primes commerciales peuvent être indiquées par P'' et la valeur de rachat d'une police par V''.

On emploie les symboles composés suivants :

(Ia) = Valeur d'une annuité } commençant par 1 et augmentant
(IA) = Valeur d'une assurance } de 1 par année.

(va) = Valeur d'une annuité variable.

(vA) = Valeur d'une assurance variable.

Si l'opération dont on cherche la valeur doit être temporaire, le symbole de limitation est placé en dehors de la parenthèse. Ainsi :

$(Ia)_{x\overline{n}|}$ = Valeur d'une annuité croissante temporaire.

$(IA)^1_{x\overline{n}|}$ = Valeur d'une assurance croissante temporaire.

$(va)_{x\overline{n}|}$ = Valeur d'une annuité variable temporaire.

$(vA)^1_{x\overline{n}|}$ = Valeur d'une assurance variable temporaire.

S'il n'y a que l'augmentation ou la variation qui soit temporaire, l'opération devant durer la vie entière, on place alors le symbole de limitation immédiatement après le symbole I ou v. Ainsi :

$(I_{\overline{n}|}a)_x$ = Valeur d une annuité viagère
$(I_{\overline{n}|}A)_x$ = Valeur d'une assurance pour la vie entière
} croissant pendant n années.

$(v_{\overline{n}|}a)_x$ = Valeur d'une annuité viagère
$(v_{\overline{n}|}A)_x$ = Valeur d'une assurance pour la vie entière
} variable pendant n années.

Colonnes de commutation:

$D_x = v^x l_x.$
$N_x = D_{x+1} + D_{x+2} + D_{x+3} + \text{etc.}$
$\mathbb{N}_x$ / $\mathbf{N}_x$ $= D_x + D_{x+1} + D_{x+2} + \text{etc.}$
$S_x = N_x + N_{x+1} + N_{x+2} + \text{etc.}$
$C_x = v^{x+1} d_x.$
$M_x = C_x + C_{x+1} + C_{x+2} + \text{etc.}$
$R_x = M_x + M_{x+1} + M_{x+2} + \text{etc.}$

Lorsque l'on désire construire les colonnes relatives aux assurances de façon à obtenir directement les primes pour les assurances payables au moment du décès, on place au-dessus des symboles une barre comme signe distinctif. Ainsi:

$\overline{C}_x = v^{x+\frac{1}{2}} d_x$, approximativement.
$\overline{M}_x = \overline{C}_x + \overline{C}_{x+1} + \overline{C}_{x+2} + \text{etc.}$
$\overline{R}_x = \overline{M}_x + \overline{M}_{x+1} + \overline{M}_{x+2} + \text{etc.}$

Têtes réunies:—

$D_{xy} = v^{\frac{x+y}{2}} l_x l_y$
$N_{xy} = D_{x+1:y+1} + D_{x+2:y+2} + D_{x+3:y+3} + \text{etc.}$
$C_{xy} = v^{\frac{x+y}{2}+1} (l_y l_x - l_{x+1} l_{y+1})$
$M_{xy} = C_{xy} + C_{x+1:y+1} + C_{x+2:y+2} + \text{etc.}$
$C^1_{xy} = v^{\frac{x+y}{2}+1} d_x l_{y+\frac{1}{2}}$
$M^1_{xy} = C^1_{xy} + C^{\frac{1}{2}}_{x+1:y+1} + C^{\frac{1}{2}}_{x+2:y+2} + \text{etc.}$

Sélection:

Des crochets dans l'indice d'un symbole indiquent que l'âge considéré est affecté par la sélection.

Un terme additionnel dans l'indice, non enfermé par des crochets, indique le nombre d'années écoulées depuis que la tête considérée est soumise à l'influence de la sélection. L'indice total indique l'âge actuel de la tête. Par exemple:

$a_{[x]}$ = Valeur actuelle d'une annuité sur une tête actuellement âgée de x années et soumise dès le moment présent à l'influence de la sélection.

$a_{[x]+n}$ = Valeur actuelle d'une annuité sur une tête actuellement âgée de $x+n$ années et soumise depuis n années à l'influence de la sélection.

$a_{[x-n]+n}$ = Valeur actuelle d'une annuité sur une tête d'âge x, et soumise à l'influence de la sélection depuis n années, à l'âge $x-n$.

De même pour les autres fonctions.

Remarques.

Le Dr. SPRAGUE, tout en approuvant en général la liste des symboles et des fonctions que nous venons d'exposer, et acceptant par conséquent la présente note, pense que la disposition et les explications pourraient être améliorées, et que l'on pourrait avec avantage, y ajouter quelques symboles supplémentaires. Il se propose donc de préparer un rapport sur cette question et de le soumettre au Congrès de Paris de 1900.

Le Dr. SPRAGUE et M. KING estiment que P, V et W doivent être employés seuls, et non pas combinés avec d'autres symboles (tels que A ou a), sauf lorsqu'il s'agit d'opérations complexes où il pourrait y avoir de la confusion.

Le Dr. KARUP désire signaler qu'il regarde les symboles $i^{(m)}$ et $\bar{\imath}$ comme superflus, car les trois lettres i, $j_{(m)}$, et δ suffisent pour indiquer toutes les rélations entre le taux réel et le taux apparent de l'intérêt. En effet, nous avons par la définition de $j_{(m)}$, $i=\left(1+\frac{j_{(m)}}{m}\right)^m-1$, de sorte que $i^{(m)}$ et i sont en réalité identiques. D'autre part, il résulte de la définition de δ que $i=e^{\delta}-1=e^{j_{(m)}}-1$, de sorte que $\bar{\imath}$ et i sont aussi identiques.

DIE GEMEINSAME BEZEICHNUNGSWEISE.

Die Grundzüge eines allgemein einzuführenden Systems von Bezeichnungen in der Lebensversicherungstechnik nach dem einstimmigen Beschlusse des zweiten Kongresses für Versicherungswissenschaft vom 19. *Mai* 1898. *Dargestellt von dem zu diesem Zwecke niedergesetzten Kommitee (bestehend aus den* Herren Am. Bégault, *Brüssel;* Dr. J. Karup, *Gotha;* George King, *London;* Léon Marie, *Paris; und* Dr. T. B. Sprague, *Edinburg).*

Die Bezeichnungsweise, wie sie hier vorgeschlagen ist, schliesst sich nahe an diejenige an, welche in dem *Text-Book* (technischen Handbuch) des *Institute of Actuaries*, II. Theil, angewendet worden und die auf der systematischen Handhabung einiger einfachen Grundregeln beruht. Zur Erläuterung der letzteren wird eine ausreichende Zahl von Beispielen dienen. Unberücksichtigt geblieben sind diejenigen Bezeichnungen des *Text-Book*, welche eines internationalen Charakters entbehren. Andererseits hat man, um einem auf dem Kongresse mehrfach geäusserten Wunsche zu entsprechen und weil dies thatsächlich in vielen Fällen als vortheilhaft erscheint, P, V und W nicht mehr als selbständige Zeichen behandelt, sondern als solche, welche nur in Verbindung mit anderen Symbolen (dem Baarwerthe der Versicherung) Bedeutung erlangen. Mit Rücksicht auf die starke Opposition, die von anderer Seite hiergegen geltend gemacht worden ist, soll es indess gestattet sein, überall da, wo Verwechslungen ausgeschlossen erscheinen, auch P, V und W allein anstatt der zusammengesetzten Bezeichnungen zu gebrauchen. Neu ist die Einführung von Accenten bei den Symbolen P, V, &c., um damit Bruttoprämien, Reserveprämien (Prämien, welche lediglich für die Reserveberechnung Verwendung finden und sich von den reinen Prämien der als maassgebend angesehenen Rechnungsgrundlagen unterscheiden) und ähnliche, mit den gewöhnlichen korrespondirende Funktionen zu bezeichnen.

Abgewichen von der Bezeichnungsweise des *Text-Book* wurde nur insofern, als die reducirte beitragsfreie Versicherung nicht durch (FP),

sondern durch den bisher unbenutzten Buchstaben W dargestellt ist, womit eine Forderung verschiedener Kongress-Redner erfüllt wird, und als fernerhin q nur die Sterbenswahrscheinlichkeit für ein Jahr bedeuten soll, während Q für die entsprechende Wahrscheinlichkeit einer grösseren Zeitstrecke angewandt wird.

Die Bezeichnungen, welche sich auf "*Selection*" oder "*Auswahl*" (Sterblichkeitstafeln mit Abstufung der Sterblichkeit nach Alter und Versicherungsdauer bez. die zugehörigen Geldwerthe) beziehen, sind dieselben, welche das Institute of Actuaries in London amtlich in seinen Publikationen: *Select Life Tables* und *Joint Life Annuity Tables* benutzt hat.

Verzinsung :—

i = wirklicher Zinsfuss, nämlich der Zins, der von dem Kapital 1 im Laufe eines Jahres erzielt wird, wenn der Zins nur einmal und zwar am Ende des Jahres fällig ist.

$j_{(m)} = m\{(1+i)^{\frac{1}{m}}-1\}$ = nomineller Zinsfuss oder m faches des terminlichen Zinses vom Kapital 1, wenn der Zins m mal im Jahre fällig ist.

$i^{(m)}$ = wirklicher Zinsfuss, welcher dem in m Terminen fälligen Jahreszins von 1 entspricht.

$\bar{\imath}$ = wirklicher Zinsfuss, welcher bei kontinuirlicher Zahlung des Zinses erzielt wird. (Grenzfall von $i^{(m)}$ für $m=\infty$.)

$v = (1+i)^{-1}$ = Baarwerth des nach 1 Jahr fälligen Kapitals 1 (Abzinsungsfaktor).

$d = 1-v$ = Diskont von 1, nach einem Jahre zahlbar.

$\delta = j_{(\infty)} = \log \text{ nat } (1+i) = -\log \text{ nat } (1-d)$ = Zins-oder Diskontkraft (Zins-Intensität).

$a_{\overline{n}|} = v+v^2+v^3+\&c.+v^n$ = Anfangswerth einer n Jahre lang, postnumerando zahlbaren sicheren Rente von 1.

$s_{\overline{n}|} = 1+(1+i)+(1+i)^2+\&c.+(1+i)^{n-1}$ = Endwerth einer n Jahre lang, postnumerando zahlbaren sicheren Rente von 1.

Sterblichkeitstafeln :—

Ein Buchstabe in Klammern, wie (x) bedeutet "eine Person vom Alter x."

Für jede Art von Funktion gilt ein besonderer Buchstabe, dessen Bedeutung im Einzelfall durch angehängte Indices u. dergl. näher definirt wird.

l = Zahl der Lebenden.

d = Zahl der Sterbenden.

L = Bevölkerung (Zahl der Personen bei stationärer Bevölkerung).

p = Lebenswahrscheinlichkeit.

q, Q = Sterbenswahrscheinlichkeit, wobei q sich auf ein Jahr, Q auf eine längere Zeitstrecke bezieht.

μ = Sterblichkeitskraft $\left(\text{oder Sterblichkeitsintensität} = -\frac{1}{l}\cdot\frac{dl}{dx}\right)$.

m = Centrales Sterblichkeitsverhältniss (Verhältniss zwischen der Zahl der Sterbefälle und der von den Lebenden durchlebten Zeit).
e = mittlere Lebensdauer.
E = Versicherung auf den Lebensfall.
a = Werth der ganzjährigen nachschüssigen (postnumerando zahlbaren) Leibrente 1.
$\mathbf{a}$ = Werth der ganzjährigen vorschüssigen (praenumerando zahlbaren) Leibrente 1.
A = Baarwerth oder einmalige Prämie der Versicherung auf den Todesfall.
V = Policenwerth oder Prämienreserve.
W = Reducirte beitragsfreie Versicherung.*
P, π = Jahresprämie, wobei P im Allgemeinen reine Prämien und π specielle Prämien, z. B. Prämien für Versicherungen mit Prämien-Rückgewähr vertritt.

Die in Frage kommenden Alter werden in Gestalt kleiner Buchstaben dem Symbol als Indices unten rechts angehängt, und wenn es sich um verbundene Leben handelt, ohne Unterscheidungszeichen aneinandergereiht. Man hat also

l_x = Zahl der Lebenden beim Alter x in der Sterblichkeitstafel.
d_x = Zahl der Sterbefälle zwischen den Altern x und $x+1$.
p_x = Wahrscheinlichkeit, dass (x) ein Jahr überlebt.
q_x = Wahrscheinlichkeit, dass (x) innerhalb eines Jahres stirbt.
m_x = Centrales Sterblichkeitsverhältniss für die Altersstrecke x bis $x+1$, angenähert $=\mu_{x+\frac{1}{2}}$.
a_x = Ganzjährige Leibrente 1, für die Lebensdauer von (x), postnumerando zahlbar.
$\mathbf{a}_x$ = dieselbe Leibrente, praenumerando zahlbar.
a_{xyz} = Ganzjährige, postnumerando zahlbare Verbindungsrente von 1 (bis zum Tode des Erststerbenden laufende Rente) für (x), (y) und (z).
A_x = Versicherung von 1, zahlbar am Ende desjenigen Jahres, in welchem (x) stirbt.
A_{xyz} = Versicherung von 1, zahlbar am Ende desjenigen Jahres, in welchem die Verbindung von (x), (y), (z) erlischt.

Wird ein Buchstabe im Index durch einen rechten Winkel eingeschlossen, so bezeichnet er nicht ein Alter, sondern eine bestimmte Zahlungsdauer. So hat man

$a_{x\overline{n}|}$ = Leibrente von 1, zahlbar während der Dauer des Lebens von (x) innerhalb der bestimmten Zeit von n Jahren, *d.i.* eine kurze Leibrente für n Jahre auf das Leben von (x).
$\mathrm{A}_{x\overline{n}|}$ = Versicherung von 1, zahlbar am Ende des Todesjahres von (x), falls dieser innerhalb der Zeit von n Jahren stirbt, oder nach Ablauf von n Jahren, wenn (x) dann noch am Leben ist, also eine abgekürzte (gemischte, alternative) Versicherung für n Jahre.

* In dem *Text-Book* mit (FP) bezeichnet.

Reducirt sich der Index auf einen einzelnen, im rechten Winkel stehenden Buchstaben, so kommt nur eine bestimmte Zeit (keine Sterblichkeit) in Frage.

$a_{\overline{n}|}$ = Sichere Rente für n Jahre.

$A_{\overline{n}|}$ = v^n = Baarwerth des Kapitals 1, sicher zahlbar nach Ablauf von n Jahren.

Werden Buchstaben des Index durch einen senkrechten Strich von einander getrennt, so wird vorausgesetzt, dass die vor dem Strich gekennzeichneten Personen zuerst sterben. Dementsprechend ist

$a_{y|x}$ = Leibrente von 1 auf das Leben von (x), zahlbar nach dem Tode von (y).

$A_{z|xy}$ = Versicherung von 1, zahlbar bei der Auflösung der Verbindung von (x) und (y), vorausgesetzt, dass Beide (z) überleben.

Erscheint ein horizontaler Strich über dem Index, so kommen nicht verbundene Leben, sondern "Überlebende" in Frage. Die Zahl der Überlebenden wird durch einen Buchstaben oder eine Zahl am rechten Ende des Strichs und oberhalb desselben bezeichnet. Ist dem Buchstaben, der r sein mag, kein weiteres Merkmal hinzugefügt, so sind *mindestens* r Überlebende, ist derselbe dagegen in eckige Klammern eingeschlossen, so sind *genau* r Überlebende gemeint. Erscheint überhaupt kein Buchstabe oberhalb des Strichs, so bedeutet dies so viel wie die Einheit und dass *mindestens* eine Person die Anderen überleben muss. Man hat hiernach

$e_{xyz\ldots.(m)}^{\quad r}$ = Mittlere Verbindungsdauer von (m) Personen und wenigstens r Überlebenden.

$p_{xyz\ldots.(m)}^{\quad [r]}$ = Wahrscheinlichkeit, dass von n Personen gerade r ein Jahr überleben.

$a_{\overline{xyz}}$ = Leibrente von 1, zahlbar solange wenigstens eine der Personen (x), (y), (z) am Leben ist.

Ziffern, welche oberhalb oder unterhalb der Buchstaben im Index auftreten, bezeichnen die Reihenfolge, in welcher die Leben zu erlöschen haben. Die Ziffer oberhalb des Index deutet auf das Leben hin, von dessen Erlöschen das Ereigniss endgültig abhängt, die Ziffern unterhalb des Index dagegen bestimmen die Reihenfolge, in welcher die anderen Leben zu erlöschen haben. So ist

$\left.\begin{matrix} Q^1_{xyz} \\ Q^2_{xyz} \\ Q^3_{xyz} \end{matrix}\right\}$ = Gesammte Wahrscheinlichkeit, dass von den drei Leben $\left\{\begin{matrix} (x) \text{ zu erst} & \text{sterben wird.} \\ \text{,,} \quad \text{zweit} & \text{,,} \quad \text{,,} \\ \text{,,} \quad \text{dritt} & \text{,,} \quad \text{,,} \end{matrix}\right.$

$A^{\ 4}_{wxyz\ 3\,2\,1}$ = Versicherung von 1, zahlbar am Ende des Todesjahres von (w), falls dieser zuletzt stirbt und die übrigen Leben in folgender Reihenfolge sterben: (z) zu erst, (y) zu zweit, (x) zu dritt.

$\left.\begin{matrix} a^{\overline{yz}|x}_{\ 1} \\ \text{oder } a^{\ 2}_{yz|x} \end{matrix}\right\}$ = $\left\{\begin{matrix} \text{Leibrente von 1 für } (x), \text{ zahlbar nach dem Tode von } (y) \\ \text{und } (z), \text{ vorausgesetzt, dass } (z) \text{ vor } (y) \text{ stirbt.} \end{matrix}\right.$

$A^{\ z}_{\overline{xy}:\ 3}$ = Versicherung von 1, zahlbar am Ende des Todesjahres des Überlebenden von (x) und (y), falls er vor (z) stirbt (also zahlbar, falls (z) die beiden andern Personen überlebt).

Bedingt die Deutlichkeit eine Trennung der Buchstaben im Index, so wird ein Doppelpunkt angewandt, nicht aber ein Punkt oder Komma, was bei Einführung von Zahlen leicht als Decimalzeichen aufgefasst werden könnte. Man schreibt also $a_{x+n:y+n}$ und $A_{35:40}$.

Ein Buchstabe in der Ecke links unten bezeichnet die Anzahl von Jahren, auf welche sich die Wahrscheinlichkeit oder Anwartschaft bezieht. Demnach ist

$_np_x$ = Wahrscheinlichkeit, dass (x) nach n Jahren lebt.
$_n\mathrm{E}_x$ = Werth der Versicherung von 1 auf den Lebensfall für (x), zahlbar nach n Jahren.

Folgt einem Buchstaben an der genannten Stelle ein senkrechter Strich, so ist eine Periode des Aufschubs gemeint, geht umgekehrt dem Buchstaben ein senkrechter Strich voraus, eine begrenzte Gültigkeitsdauer.

$_{n|}q_x$ = Wahrscheinlichkeit, dass (x) nach Ablauf von n Jahren innerhalb Jahresfrist, und also im Laufe des $n+1^{\text{ten}}$ Jahres sterben wird.
$_{|n}\mathrm{Q}_x$ = Wahrscheinlichkeit, dass (x) innerhalb n Jahren stirbt.
$_{n|}a_x$ = $a_{\overline{n}|}{}_x$ = Leibrente von 1 auf das Leben von (x), um n Jahre aufgeschoben, also eine Leibrente, welche zum ersten Male nach $n+1$ Jahren fällig wird.
$_{|n}a_x$ = $a_{x\overline{n}|}$ = Kurze Leibrente von 1 auf das Leben von (x) für n Jahre.
$_{t|n}a_x$ = Unterbrochene Leibrente von 1, nämlich Leibrente auf das Leben von (x), welche t Jahre aufgeschoben ist und n Jahre läuft.

Ein Buchstabe in Klammern an der rechten oberen Ecke des Symbols zeigt die Zahl von Intervallen an, in welche das Jahr zu theilen ist. Demgemäss ist

$a^{(m)}$ = Leibrente von 1, zahlbar in m Raten innerhalb des Jahres mit je $\frac{1}{m}$.
$\mathrm{A}_x^{(m)}$ = Versicherung von 1, zahlbar am Ende desjenigen Jahresbruchtheiles von $\frac{1}{m}$, in welchem (x) stirbt.

Wird das Jahr in unendlich viele Theile zerlegt oder was dasselbe ist, wird m unendlich gross, so ersetzt man m nicht durch ∞, sondern versieht das Symbol mit einem horizontalen Strich oberhalb desselben. Also

$\bar{a}$ = kontinuirliche Leibrente von jährlich 1.
$\bar{\mathrm{A}}$ = Versicherung von 1, zahlbar im Augenblick des Todes.

Ein kleiner Kreis oberhalb des Symbols deutet an, dass die Lebensdauer voll, eventuell mit einer proportionalen Zahlung zu berücksichtigen ist. Man hat also

$\mathring{e}$ = Volle mittlere Lebensdauer.
$\mathring{a}$ = Komplette Leibrente (wobei für die nach dem letzten regelmässigen Zahlungstermin durchlebte Zeit eine proportionale Zahlung zu leisten ist).

Bei Überlebensrenten sind die Termine, an welchen die Rente eventuell zu zahlen ist, zuweilen im voraus völlig bestimmt, zuweilen hängen sie von dem Zeitpunkt ab, in welchem das den Rentengenuss begründende Ereigniss eintritt. Es soll nun sein

$a_{y|x}$ = Überlebensrente von 1 für (x), zum ersten Male zahlbar am Ende des Todesjahres von (y) oder im Durchschnitt sechs Monate nach dem Tode von (y).

$\hat{a}_{y|x}$ = Überlebensrente von 1 für (x), zum ersten Male zahlbar ein Jahr nach dem Tode von (y).

$\hat{\hat{a}}_{y|x}$ = Komplette Überlebensrente von 1 für (x), zum ersten Male zahlbar ein Jahr nach dem Tode von (y), zum letzten Male beim Tode von (x) mit proportionaler Rate für die seit dem letzten regelmässigen Zahlungstermin durchlebte Zeit.

Die Symbole P für (Jahres-) Prämie, V für Prämienreserve, und W für reducirte beitragsfreie Versicherungen, sind in der Regel mit den Symbolen zu verbinden, welche die Baarwerthe oder einmaligen Prämien der Versicherungen darstellen. Demgemäss ist

$\mathrm{P}(\mathrm{A}^1_{xy})$ = Jahresprämie einer einseitigen Überlebensversicherung von 1 auf das Leben von (x) zu Gunsten von (y).

${}_t\mathrm{V}(\mathrm{A}_{x\overline{n}|})$ = Prämienreserve einer abgekürzten (gemischten) Versicherung von 1 für (x) nach t Jahren.

${}_t\mathrm{W}(\mathrm{A}_x)$ = Reducirte beitragsfreie Versicherung an Stelle einer gewöhnlichen Versicherung auf den Todesfall von 1, die auf das Leben von (x) abgeschlossen und t Jahre in Kraft war.

Indices, etc., welche die Art der Versicherung bezeichnen, sind dem Symbol der letzteren, solche, welche die Art der Prämienzahlung andeuten, dem Symbol P anzuhängen, so dass man hat

${}_n\mathrm{P}(\overline{\mathrm{A}}_x)$ = Jahresprämie, n Jahre hindurch zahlbar, für eine unmittelbar nach dem Tode zahlbare Versicherung von 1 (Versicherung auf den Todesfall mit Prämienablösung).

$\mathrm{P}_{xy}(\mathrm{A}_x)$ = Jahresprämie, zahlbar während der Verbindungsdauer von (x) und (y) für eine Versicherung von 1, fällig am Ende des Todesjahres von (x).

${}_t\mathrm{P}^{(m)}(\mathrm{A}_{x\overline{n}|})$ = Jahresprämie, in m Raten innerhalb des Jahres durch längstens t Jahre zahlbar für eine auf das Alter $x+n$ abgekürzte Versicherung von 1.

Es ist indess zulässig, in einfachen Fällen, wo Verwechslungen ausgeschlossen sind, die Buchstaben P, V und W selbständig anzuwenden, so dass P^1_{xy} für $\mathrm{P}(\mathrm{A}^1_{xy})$, ${}_t\mathrm{V}_{x\overline{n}|}$ für ${}_t\mathrm{V}(\mathrm{A}_{x\overline{n}|})$ und ${}_t\mathrm{W}_x$ für ${}_t\mathrm{W}(\mathrm{A}_x)$ geschrieben werden kann.

In besonderen Untersuchungen, wo modificirte Werthe bekannter Funktionen vorkommen, empfiehlt es sich, Accente anzuwenden. Soll z.B. bei Berechnung der Prämienreserve anstatt der reinen Prämie eine besondere (aus einer anderen Tafel genommene oder mit einem gewissen Aufschlage versehene) angewandt werden, so bezeichne

man sie mit P′ und die zugehörige Prämienreserve mit V′. Ebenso kann die Tarifprämie mit P″, die Abgangsentschädigung mit V″ und die von der Anstalt thatsächlich gewährte reducirte beitragsfreie Versicherung mit W″ bezeichnet werden.

Die folgenden zusammengesetzten Symbole sind noch zu nennen:

(Ia) = Leibrente
(IA) = Versicherung auf den Todesfall } beginnend mit dem Betrage 1 und steigend um den Betrag 1 jährlich.
(va) = Variirende Leibrente.
(vA) = Variirende Versicherung auf den Todesfall.

Sind die betreffenden Leibrenten oder Versicherungen von beschränkter Dauer, so hat das Symbol, welches dies andeutet, ausserhalb der Klammern zu erscheinen.

$(Ia)_{x\overline{n}|}$ = Kurze, um jährlich 1 wachsende Leibrente von anfänglich 1.
$(IA)^{1}_{x\overline{n}|}$ = Kurze, um jährlich 1 wachsende Versicherung auf den Todesfall von anfänglich 1.
$(va)_{x\overline{n}|}$ = Kurze variirende Leibrente.
$(vA)^{1}_{x\overline{n}|}$ = Kurze variirende Versicherung auf den Todesfall.

Soll nur die Steigerung oder die Variation von beschränkter Dauer sein, die Versicherung selbst aber für das ganze Leben gelten, so ist das Symbol unmittelbar an das Symbol I oder v anzuhängen.

$(I_{\overline{n}|}a)_x$ = lebenslängliche Leibrente
$(I_{\overline{n}|}A)_x$ = „ Versicherung auf den Todesfall } mit 1 beginnend und n Jahre jährlich um 1 wachsend.
$(v_{\overline{n}|}a)_x$ = lebenslängliche Leibrente
$(v_{\overline{n}|}A)_x$ = „ Versicherung auf den Todesfall } n Jahre variirend.

Diskontirte Zahlen und deren Summen. (Kommutations-Kolumnen).

$$\begin{aligned}
D_x &= v^x l_x.\\
N_x &= D_{x+1}+D_{x+2}+D_{x+3}+\&c.\\
\left.\begin{matrix}\mathbb{N}_x\\ \mathbf{N}_x\end{matrix}\right\} \text{oder } &= D_x+D_{x+1}+D_{x+2}+\&c.\\
S_x &= N_x+N_{x+1}+N_{x+2}+\&c.\\
C_x &= v^{x+1}d_x.\\
M_x &= C_x+C_{x+1}+C_{x+2}+\&c.\\
R_x &= M_x+M_{x+1}+M_{x+2}+\&c.
\end{aligned}$$

Sollen die diskontirten Zahlen der Sterbefälle und ihre Summen unmittelbar die Prämien ergeben, welche bei sofortiger Auszahlung der Versicherungssumme im Todesfall Geltung haben, so sind die zugehörigen Symbole durch einen wagrechten Strich oberhalb derselben auszuzeichnen. Demgemäss hat man

$$\begin{aligned}
\overline{C}_x &= v^{x+\frac{1}{2}}d_x, \text{ angenähert.}\\
\overline{M}_x &= \overline{C}_x+\overline{C}_{x+1}+\overline{C}_{x+2}+\&c.\\
\overline{R}_x &= \overline{M}_x+\overline{M}_{x+1}+\overline{M}_{x+2}+\&c.
\end{aligned}$$

Verbundene Leben :—

$$\begin{aligned}
D_{xy} &= v^{\frac{x+y}{2}} l_x l_y \\
N_{xy} &= D_{x+1:y+1} + D_{x+2:y+2} + D_{x+3:y+3} + \&c. \\
C_{xy} &= v^{\frac{x+y}{2}+1}(l_x l_y - l_{x+1} l_{y+1}) \\
M_{xy} &= C_{xy} + C_{x+1:y+1} + C_{x+2:y+2} + \&c. \\
C^1_{xy} &= v^{\frac{x+y}{2}+1} d_x l_{y+\frac{1}{2}} \\
M^1_{xy} &= C^1_{xy} + C_{\frac{1}{x+1}:y+1} + C_{\frac{1}{x+2}:y+2} + \&c.
\end{aligned}$$

Selection :—

Das Alter, mit welchem die Auswahl stattfindet, wird in eckigen Klammern geschrieben. Treten im Index ausserhalb der eckigen Klammern additive Glieder hinzu, so bezeichnen diese die Zeit, welche seit der Auswahl verflossen ist. Der gesammte Index bezeichnet daher, wie gewöhnlich, das gegenwärtige Alter der Person; und man hat

$a_{[x]}$ = Werth der Leibrente 1 für eine eben ausgewählte (aufgenommene) Person vom Alter x.

$a_{[x]+n}$ = Werth der Leibrente 1 für eine Person vom gegenwärtigen Alter $x+n$, die vor n Jahren mit den Alter x ausgewählt wurde.

$a_{[x-n]+n}$ = Werth der Leibrente 1 für eine Person vom gegenwärtigen Alter x, die vor n Jahren im Alter $x-n$ ausgewählt wurde.

Aehnliches gilt für andere Funktionen.

Bemerkungen :—

Herr Dr. Sprague ist im Allgemeinen mit den vorstehenden Festsetzungen einverstanden, hält aber die Reihenfolge, in welcher sie hier erscheinen, sowie die Darstellungsweise für verbesserungsfähig und möchte überdies die Liste um einige weitere Symbole vermehrt wissen. Er beabsichtigt desshalb den Gegenstand neu zu behandeln und seine Arbeit dem Pariser Kongresse von 1900 vorzulegen.

Herr Dr. Sprague und Herr King sind übereinstimmend dafür, dass die Symbole P, V, und W im Allgemeinen selbständig und nur in besonders komplicirten Fällen in Verbindung mit anderen (wie A und a) benutzt werden sollen.

Herr Dr. Karup möchte betonen, dass er die Grössen $i^{(m)}$ und $\bar{\imath}$ für entbehrlich hält, da i, $j_{(m)}$ und δ allein genügen, um die Verhältnisse zwischen wirklichem und nominellem Zins festzulegen. Aus der gegebenen Definition von $j_{(m)}$ folgt nämlich durch Umkehrung $i = \left[1 + \frac{j_{(m)}}{m}\right]^m - 1$ und es ist daher in Wirklichkeit $i^{(m)}$ und i identisch. Und ebenso folgt aus der Definition von δ, dass $i = e^{\delta} - 1 = e^{j_{(m)}} - 1$, so dass auch $\bar{\imath}$ mit i zusammenfällt.

Lexiques internationaux d'Actuariat.

RAPPORT DE M. ALBERT QUIQUET.

Comme le portait, dans son premier article, le Règlement du Congrès de Bruxelles, les réunions du genre de la nôtre ont pour objet "de faciliter entre les actuaires des divers pays l'établissement de relations de confraternité." Parmi les moyens qui ont été antérieurement préconisés, notre regretté collègue, M. Martin-Dupray, a signalé l'échange des publications; et je n'ai pas à revenir sur le commun accord qui a accueilli la lecture de ses conclusions. Il m'a semblé que cet échange de publications, pour porter tous ses fruits, entrainait un corollaire. Sur ma proposition, l'Institut des Actuaires français a bien voulu décider de soumettre au Congrès la question que je lui ai sommairement exposée en décembre 1897; quelques mots suffiront pour la faire connaître.

Les journaux, les mémoires, les communications diverses, que nous publions un peu partout et que nous échangeons, ont naturellement le défaut d'être écrits dans des langues très différentes. À un certain point de vue, nous ne le regrettons pas, car cette variété prouve l'extension presque universelle de notre science; il n'en est pas moins vrai que leur lecture est plus ou moins pénible, pour ceux dont le bagage linguistique est rudimentaire.

Sans doute, les formules mathématiques, que nous rencontrons de ci de là, aident à comprendre, ou, plus exactement, à deviner un texte qui nous échappe. Mais il serait, croyons-nous, aisé d'arriver à mieux. Nos termes professionnels sont en somme assez restreints, et leur réunion comprendrait à peine quelques pages; je proposerais d'y joindre les expressions de finance, de banque, etc., que nous sommes exposés à rencontrer. Le tout ne formerait pas un bien gros volume.

Les dictionnaires usuels laissent ces termes de côté, ou les expliquent mal; et des hommes du métier, au courant de la langue, seuls sont capables de rectifier les erreurs.

L'ouvrage qui, jusqu'ici, parait à peu près répondre à cet objet, est celui de M. et A. Méliot: "Dictionnaire explicatif, Franco-anglais et Anglo-français, de Finance, de Bourse, de Sociétés et de Mines d'Or."[1]

[1] Boyveau et Chevillet, 22 Rue de la Banque à Paris; Effingham Wilson, 11 Royal Exchange, London. 1897.

La fin du titre donne à entendre la préoccupation principale des auteurs ; tel quel, et malgré son insuffisance évidente en ce qui concerne l'actuariat, il nous a rendu plus d'une fois service. M. et A. Méliot ont aussi, croyons-nous, préparé le même dictionnaire français-allemand, et anglo-germain. L'un des nôtres, M. Henriquez Pimentel, est l'auteur d'un dictionnaire, anglais-hollandais et hollandais-anglais, qui est également à consulter.

Sans insister davantage sur ce qui existe, nous répondrons de suite aux interrogations que l'on nous posera : 1°, dans quelle langue établir un lexique d'actuariat ; 2°, qui l'établira.

Un lexique évidemment ne sert de truchement qu'entre deux langues, et le nombre des lexiques serait celui des idiomes que nous parlons ici, associés deux à deux. Ce travail serait de proportions notables, si une grande partie n'était susceptible d'être économisée.

La majorité des membres étrangers de ce Congrès lit l'anglais, tant bien que mal ; c'est d'ailleurs en Angleterre que se sont publiés les plus anciens et les plus importants travaux d'actuariat ; et, si une forme particulière d'hommage était à rendre à notre profession, c'est certainement à nos confrères de la Grande-Bretagne qu'elle s'adresserait. On commencerait donc par réunir en dictionnaire les termes anglais, et on en donnerait la définition, en anglais aussi ; nous ne voyons pas d'inconvénient à ce que cette définition soit aussi étendue qu'il convient.

Chaque pays dresserait ensuite son lexique national, ou mieux un double lexique (pour la version et le thème anglais). En Allemagne, par exemple, à côté du mot germain, on mettrait les mots anglais qui le traduisent, et *vice-versâ*, sans répéter la définition. Les lexiques seraient ainsi de très petites dimensions, et le grand dictionnaire anglais ci-dessus les complèterait tous.

Qui, dans chaque pays, se chargera du travail ? Ici, Messieurs, la besogne serait à laisser aux initiatives individuelles, ou à celle des Instituts qui consentiraient à mettre la question à leur ordre du jour. Pour notre part, nous souhaiterions que les lexiques parussent dans leurs Bulletins ; les premières éditions seraient incomplètes, mais l'avenir les améliorerait. Nous nous permettrons d'indiquer deux modes de travail, d'une certaine utilité.

Le premier est le rapprochement des comptes rendus annuels, que certaines compagnies publient sur leurs opérations en deux ou trois langues, et qui fournissent de suite une mine plus ou moins riche de traductions toutes faites. Le second est d'inviter à une collaboration active ceux qui, pour leur part, ont déjà traduit des ouvrages d'actuariat ; peut-être ont-ils conservé des lexiques partiels que nous recevrions avec reconnaissance. Si M. Bégault trouvait des imitateurs, et que le "Text-Book" fût enfin traduit en allemand, en italien, en hollandais, etc., nous dirions presque que l'œuvre est faite, et qu'il ne s'agit plus que de la forme à lui donner. Espérons, Messieurs, qu'elle ne sera pas trop longtemps retardée, et que vous voudrez bien appuyer de votre approbation le vœu que nous formulons au nom de la confraternité des actuaires.

On International Actuarial Dictionaries. By ALBERT QUIQUET.

As is said in the first paragraph of the rules of the Congress of Brussels, gatherings of the kind have, for their object, "to facilitate "among actuaries of different countries the establishment of fraternal "relations." Among the means which were originally recognized, our regretted colleague, M. Martin Dupray, called attention to the exchange of publications, and it is not necessary for me to refer again to the common assent which his proposal received. It seems to me that this exchange of publications, in order that it may bear full fruit, necessitates a corollary. At my instance, the Institute of French Actuaries has been good enough to decide to submit to this Congress the question which I briefly brought before it in December 1897. A few words will suffice to make it known.

The journals, the papers, the sundry communications, which we publish right and left, and which we exchange, have, necessarily, the defect of being written in very different languages. From a certain point of view we do not regret this, because this variety proves the almost universal extension of our science. It is, notwithstanding, none the less true, that to read them is more or less troublesome, for those whose linguistic attainments are rudimentary.

No doubt the mathematical formulas which we meet with here and there, aid us to understand or, to be more exact, to guess at the text which escapes us; but it would be, we believe, easy to introduce an improvement. Our professional terms are, in fact, very limited in number, and they could be collected in hardly more than a few pages. I would propose to add to them the expressions used in finance, in banking, &c., which we are liable to meet with. The whole of them together would not constitute a large volume.

The ordinary dictionaries omit these expressions, or explain them badly; and the members of the craft, familiar with the language, are alone able to correct these mistakes.

The work which up to now appears most fully to answer this end is that of M. and A. Méliot, an "Explanatory Dictionary, Franco-

" English and Anglo-French, of Finance, of Exchange, of Companies, " and of Gold Mines."* The end of the title shows the more special occupation of its authors, but such as it is, and notwithstanding its evident shortcomings in so far as it concerns the actuarial profession, it has on more than one occasion been useful to us. M. & A. Méliot have also, we believe, prepared the same dictionary, Franco-German and Anglo-German. One of ourselves, M. Henriquez Pimentel, is author of a dictionary, Anglo-Dutch and Dutch-English, which may also be consulted.

Without urging more the advantages of that which already exists, we shall answer in their order the questions which may be asked us, namely:

(1) In what language should the actuarial dictionary be written?

(2) Who should write it?

A dictionary evidently is of use as interpreter only between two languages, and the number of dictionaries would be that of the languages which we speak here, taken two together. This work would be of large proportions, if a large part of it were not capable of being economized.

The majority of the foreign members of the Congress can read English, either well or ill, and it is, moreover, in England that there have been published the oldest and the most important actuarial works; and if a special homage is to be rendered to our profession, it is certainly to our British brethren that it should be addressed. We should commence, therefore, by gathering together a dictionary of English terms, and by giving to them explanations in English also, and we do not see any inconvenience should these explanations be as lengthy as convenient.

Each country would then prepare its national dictionary, or, better still, a double dictionary, with the translation of the term, and the English explanation. In Germany, for instance, beside the German word they would put the English word which translates it, and *vicê versa*, without repeating the explanation. These dictionaries would therefore be of but small dimensions, and the great English dictionary above-mentioned would complete them all.

Who in each country would undertake this work? Here, gentlemen, it would be necessary to leave the matter to individual effort, or to that of the Institutes which would agree to enter the question on their agenda. For our part, we should hope that the dictionary would find place in their journals. The first edition would be incomplete, but in the future that would be remedied. We venture to point out two methods of work possessing certain advantages.

The first is the collation of the annual accounts of their transactions, which certain companies publish in two or three languages, and which would at once furnish a mine, more or less rich, of translations already made. The second is to invite the collaboration of those who, for their own part, have already translated actuarial works. Perhaps they have preserved the partial dictionaries, which we should receive

* Boyveau et Chevillet, 22, Rue de la Banque à Paris; Effingham Wilson, 11, Royal Exchange, London, 1897.

with thankfulness. Should M. Bégault find imitators, and should the *Text-Book* be at last translated into German, into Italian, into Dutch, &c., we should say that the work would be already nearly completed, and only the question would remain as to the shape to be given to it. Let us hope, gentlemen, that it will not be long delayed, and that you will kindly give your assent to the motion submitted in the name of fraternity amongst actuaries.

Discussion and Resolutions *on an International Actuarial Dictionary.*

The Chairman (Mr. Manly), in opening the discussion, said that he had himself recently become painfully sensible of the necessity for a dictionary of actuarial and commercial official words. During the last three or four months he had received communications from all over the world in several languages; and although he had been able to obtain the assistance of translators of those languages, yet it had been found most difficult by these gentlemen to give an exact interpretation of many of the technical and commercial terms. Personally, he thought the work would be an admirable one, and of great value, not only to the members of the Congress, but to the whole commercial world. His own suggestion would be that the work should take the form of three small volumes, the first volume starting with the English, and containing the French and German equivalents; the second starting with the French, and containing the German and English equivalents; and the third commencing with the German, and containing the English and French equivalents. He thought such a work would tend more than anything else to promote international correspondence upon their very important and interesting science.

M. L. Marie, (France), said that he was in entire agreement with M. Quiquet as to the great advantages that would follow the publication of the proposed volumes, but he thought that to carry out the undertaking would involve a great amount of work. Moreover, difficulties of many kinds would certainly arise. The speaker therefore thought the publication should be entrusted to a small body possessing both the necessary funds and a competent knowledge. The Executive Council of the Permanent Committee seemed to be the organization best qualified in such a matter, and he therefore suggested to remit the work to that body to bring it to a successful issue. As the expenses would doubtless be comparatively high, it was to be hoped that the actuarial societies now existing in the various countries would contribute to the common task their financial help as well as their moral support.

M. Léon Marie est tout à fait d'accord avec M. Quiquet, au sujet des avantages considérables que présenterait la publication des volumes projetés. Mais il croit que la mise à exécution du projet nécessitera une somme très grande de travail. En outre, des difficultés de divers ordres surgiront certainement. L'orateur pense donc que la publication doit être confiée à un groupe possèdant, tout à la fois, des ressources matérielles et une compétence suffisante. Le Conseil de Direction du Comité permanent semble le mieux qualifié en pareil cas. L'orateur propose de lui remettre le soin de mener à bonne fin le travail projeté. Comme les dépenses seront relativement élevées sans doute, il faut espérer que les sociétés actuarielles, existant aujourd'hui dans divers pays, voudront bien apporter à l'œuvre commune leur concours financier, en même temps que leur appui moral.

M. LEPREUX, (Belguim), received with approval the proposal of M. Marie, to submit the work to the Permanent Committee. But as they were a small body it would be placing a great burden upon them to ask them to undertake the work. He, however, on behalf of himself and his colleagues, cordially accepted the task, on condition that this was not a mere momentary enthusiasm, but that all who voted for the resolution would send all such material as might assist in the work, and send regularly and copiously. The Committee wanted to collect documents of all kinds, to enable the dictionary to be prepared; and M. Lepreux asked for the assistance of every one who had such papers to supply the necessary materials. He pointed out that the Permanent Committee was not sufficiently representative, that it would gain absolutely in power and usefulness if a great many more actuaries in many countries were to join it. English actuaries were very poorly represented, and he put in a strong plea to them to join the Permanent Committee.

DR. G. SCHAERTLIN, (Switzerland), said that he concurred in what had been said, but he, nevertheless, wished to point out certain difficulties which would be met with by those undertaking the work. For instance, the term "reversion" (French "Nue Propriété") has no equivalent in some languages. Therefore a mere dictionary would not be sufficient, but it would be necessary to give a full explanation of each term. He tendered his services for the German-French section of the dictionary.

The CHAIRMAN thought all were agreed on the question, and he read the two following resolutions which had been drafted, namely:—

(1) That it is desirable that an International Dictionary of actuarial and commercial terms be prepared, printed, and published as soon as possible; and

(2) That it be referred to the Executive Council of the Permanent Committee to give effect to this resolution.

M. QUIQUET having proposed, and M. BÉGAULT having seconded these resolutions, they were put from the chair and carried unanimously.

M. MARIE said he thought that the remarks made by M. LEPREUX were very reasonable. Many actuaries had so far neglected to enrol themselves as members of the Permanent Committee. It is for the Congress to appeal to the fraternal sentiments which reflect honor on the actuaries of all countries, and he therefore submitted the following resolution:

"That the Second International Actuarial Congress, assembled in London, makes a pressing appeal to the actuaries of all countries, and urges them to join the Permanent Committee of International Actuarial Congresses, so as to strengthen that Committee from the double point of view,—the intellectual and the financial—and to unite the actuaries of the whole world for the development of actuarial science."

M. LÉON MARIE pense que l'observation presentée par M. Lepreux est extrêmement juste. Beaucoup d'actuaires ont encore négligé de se faire inscrire parmi les membres du Comité Permanent. C'est au Congrès qu'il appartient de faire appel aux sentiments de confraternité dont s'honorent les actuaires de tous les pays. L'orateur propose donc l'adoption d'une motion ainsi conçue: "Le Second Congrès International d'Actuaires, réuni à Londres, fait un pressant appel aux actuaires de tous les pays, et les engage à entrer dans le Comité Permanent des Congrès Internationaux d'Actuaires, afin de fortifier ce Comité au double point de vue, intellectuel et matériel, et d'unir les actuaires du monde entier pour favoriser le développement de la science actuarielle."

The resolution of M. MARIE, on being put from the Chair, was carried unanimously.

La Réparation des Accidents du Travail en Belgique.

Par LOUIS MAINGIE,

Actuaire Adjoint de la Compagnie Belge d'Assurances Générales sur la Vie ; Membre agrégé de l'Association des Actuaires Belges.

La question de la réparation des accidents du travail, posée en Belgique depuis de nombreuses années, n'a pas encore reçu de solution.

Cependant, stimulée par l'activité du dehors, l'activité en matière de législation sociale a été aussi grande en Belgique que dans les pays voisins. Plus d'une fois, les régimes en vigueur en Allemagne et en Autriche pour la réparation des accidents du travail, ont attiré l'attention du législateur, ont inspiré de nombreux travaux, de multiples projets de lois.

Aujourd'hui, alors que le problème a passé, à quelques variantes près, par les mêmes phases que dans les pays où la question a été résolue, alors qu'il semble que l'adoption d'une solution définitive ne puisse tarder, la plupart de ces travaux, de ces projets, ne présentent plus qu'un intérêt historique.[1]

Au point de vue de la légitimité d'une législation sociale en matière d'accidents du travail, les projets, mis à l'étude en Belgique sous l'inspiration du gouvernement, sont basés sur ce principe que la responsabilité patronale a sa source dans le contrat de travail.

C'est cette manière de voir qui fut consacrée par une Commission instituée en 1890, auprès du Ministère de la Justice, dont les travaux sont devenus caducs, en ce sens que la question a été reprise depuis pour faire l'objet de nouvelles propositions.

C'est ainsi que, le 26 novembre 1896, M. Nyssens, Ministre de l'Industrie et du Travail, déposa un projet de loi sur le contrat de travail, dont l'exposé des motifs est très explicite en ce qui concerne la question de principe : " Une des questions les plus importantes, y est-il dit, qui " se rattachent au contrat de travail des ouvriers, est celle de la répara- " tion des accidents."

[1] On trouvera dans l'excellent ouvrage de M. M. Bellom, " Les Lois d'Assurances Ouvrières à l'Étranger," tome ii. pages 931 et suivantes, des renseignements sur l'histoire de la réparation des accidents du travail en Belgique.

" Le projet ne fait à cet égard que consacrer le principe générale-
" ment admis adjourd'hui, à savoir que la responsabilité du patron trouve
" sa base dans le contrat même, qui l'oblige à veiller en bon père de
" famille à ce que le travail s'exécute dans des conditions convenables
" de salubrité et de sécurité."

" Des règles puisées à d'autres sources ont dicté à des législateurs
" étrangers et recommandent au législateur belge, des remèdes plus
" complets au problème social de la réparation des accidents du travail.
" Cette matière dont le Conseil Supérieur du travail vient d'être saisi,
" doit dans notre pensée, faire l'objet d'une loi spéciale complémentaire
" de la loi sur le contrat de travail."

Ce point admis, le problème reste soumis à toutes les divergences d'opinion.

Des discussions importantes se sont produites à propos de projets présentés soit par le gouvernement, soit par des économistes, soit par des associations syndicales. Nous ne discuterons pas les systèmes proposés en dehors de l'initiative gouvernementale, la plupart n'ayant aucune chance d'être admis à défaut de bases sérieuses. Disons seulement que l'on a rattaché au contrat de travail tous les types de solutions. L'on s'est surtout inspiré de la législation en vigueur en Allemagne et en Autriche, sous prétexte qu'une expérience de plusieurs années permettait de lui accorder crédit.

L'organisation des corporations allemandes a eu de nombreux partisans qui se sont appuyés, pour en préconiser l'imitation, sur les mêmes arguments qui ont poussé les industriels allemands à défendre le système financier de la répartition. Cependant, depuis que le Congrès des Accidents du Travail, tenu à Bruxelles en 1897, a permis de montrer, au point de vue actuariel surtout, les vices de ce système, et d'exprimer les craintes qu'il inspire pour l'avenir, on peut croire que les partisans de ce régime n'auront pas l'influence nécessaire pour l'imposer.

D'autre part, l'attention du législateur s'est plutôt portée vers la solution autrichienne. Un projet qui en adoptait les grandes lignes a été soumis au Conseil Supérieur du Travail.

Bien qu'il ne soit pas destiné à faire l'objet d'un débat au Parlement, il mérite de retenir l'attention, car il montre, par lui-même et par les discussions auxquelles il a donné lieu, quelles ont été la situation des esprits et les tendances dans certains milieux, à une époque toute récente.

Une esquisse, élaborée par l'Administration du Ministère du Travail, fut, le 9 novembre 1896, adressée par le Ministre M. Nyssens, à la Commission du Conseil Supérieur du Travail chargée d'étudier la Réparation des Accidents.

" Je dis à dessein une esquisse, dit le Ministre dans la lettre
" d'envoi ; il ne s'agit pas ici, en effet, ni d'un projet, ni même d'un
" avant-projet d'où l'on puisse inférer que le gouvernement incline vers
" telle ou telle solution des problèmes multiples que soulève la question
" des accidents du travail."

Ce texte montre que si des tendances se manifestaient en faveur du régime autrichien, le gouvernement, tout en leur ouvrant crédit, n'y était pas irréductiblement rallié.

L'esquisse comprenait deux projets dont le premier, s'appliquant à la grande industrie, stipulait l'obligation. Le second visait les indus-

tries non prévues par le premier ; il stipulait des indemnités identiques en cas d'accident, mais laissait l'assurance facultative.

L'avant projet A est du reste le seul intéressant, car il était réservé qu'un pourrait soumettre à l'obligation de l'assurance les industries de moindre importance soumises au projet B.

Outre l'obligation de l'assurance, l'avant projet A imposait l'assureur sous forme de Caisses de prévoyance contre les accidents, sortes de mutualités composées des chefs d'enterprises et de leurs ouvriers.

Ce projet, quelque peu draconien, élaboré par l'Administration du Ministère du Travail, et que, à ce titre, l'on croyait inspiré par le gouvernement, n'a pas manqué de soulever de violentes protestations. Pendant les discussions au sein de la Commission du Conseil Supérieur du Travail, une minorité assez forte se sépara nettement de la majorité sur la question de l'obligation de l'assureur. En dehors de cette commission, divers travaux critiques, dont le plus remarquable est celui de M. Adan,[1] ont été publiés. Notre intention n'est pas de reproduire à propos de cet avant projet les divergences d'opinion qu'il a soulevées, les discussions auxquelles il a donné lieu, les critiques que lui ont été adressées. Il n'était cependant pas inutile de faire remarquer, afin d'indiquer les tendances diverses, que ces critiques se sont produites, et que si ce projet de loi a eu de nombreux partisans, il a soulevé d'autre part des protestations, parfois violentes, assez fortes en tout cas pour que l'on se soit décidé à remettre la question à l'étude.

Nous pourrions terminer ici cet exposé. Mais il nous semble qu'il est tout au moins nécessaire, dans une réunion d'actuaires, d'indiquer quelle a été la position prise par les actuaires belges, à propos d'une question où il semble que leur avis n'a pas été dédaigné.

Comme le disait M. Adan dans le remarquable rapport qu'il a présenté au dernier Congrès des Accidents du Travail :—

" Si la force des choses amène l'actuaire à formuler son avis en " matière technique, imprégnée de politique, il ne compose cependant " pas sur le terrain scientifique, il a soin de laisser au seul législateur la " responsabilité de l'atteinte consciente que celui-ci porterait à la solution " scientifique après l'avoir éclairé sur cette atteinte avec toute la " déférence voulue, mais avec toute la fermeté qu'il est en droit de " montrer."

C'est en s'inspirant de ces considérations que les actuaires belges ont formulé contre l'avant projet de loi divers griefs et ont exprimé des craintes.

En faveur des mêmes raisons, on nous permettra de reproduire ici ces craintes et griefs.

Auparavant quelques explications sont nécessaires.

Les articles qui définissent les bases mathématiques du projet belge sont les suivants :

Art. 6.—Si l'accident a eu pour conséquence la mort de la victime, l'indemnité comprend :

1°. Une somme de 50 francs pour frais de funérailles ;

2°. Une pension de 20 p.c. du salaire annuel pour la veuve de la victime jusqu'à sa mort ou son remariage ;

3°. Une pension de 10 p.c. pour chaque enfant légitime jusqu'à l'âge

[1] "Le Nouvel avant Projet de Loi sur la Réparation des Accidents du Travail en Belgique," par H. F. G. Adan : Bruxelles, Lesigne, 1897.

de 15 ans, si le conjoint de la victime est en vie, et de 15 p.c. si le conjoint de la victime est décédé ou vient à mourir ;

4°. Si la victime était une femme mariée, une pension de 20 p.c. à l'époux incapable de subvenir à ses besoins aussi longtemps que dure cette incapacité ;

5°. Si la victime était célibataire, ou si les pensions mentionnées aux 2° et 3° ou aux 3° et 4° ci-dessus n'atteignent pas un total de 50 p.c., une pension de 20 p.c. au maximum pour les ascendants dont la victime était l'unique soutien, jusqu'à leur mort ou jusqu'au moment où ils ne seront plus dans le besoin.

Le montant total des pensions du conjoint, des enfants et, le cas échéant, des ascendants, ne pourra dépasser 50 p.c. ; en cas d'excédent, ces pensions doivent subir une réduction proportionelle. Toutefois, le conjoint et les enfants ont la priorité sur les ascendants ; ceux-ci n'ont droit qu'au disponible jusqu'à concurrence de 50 p.c. après règlement des pensions du conjoint et des enfants.

Les parents ont la priorité sur les grands-parents.

Les enfants naturels reconnus ont droit à indemnité comme les enfants légitimes.

La veuve qui se remarie perd tous droits à la pension, mais reçoit à titre d'indemnité finale, 20 p.c. du salaire annuel de la victime.

Art. 7.—Si l'accident a eu pour conséquence une blessure qui rend la victime incapable de se livrer à son travail habituel, l'indemnité comprend :

1°. Les soins médicaux et pharmaceutiques à partir du jour de l'accident jusqu'à la fin de la sixième semaine après celui-ci, à moins que la victime ne soit rétablie auparavant ;

2°. Un secours égal à la moitié du salaire quotidien moyen, par jour, depuis le quinzième jusqu'au vingt-huitième jour après l'accident, à moins que la victime ne soit rétablie auparavant ;

3°. Un secours supplémentaire égal à trois fois le salaire quotidien moyen, si la victime n'est pas rétablie après le vingt-huitième jour.

L'indemnité comprend en outre, au minimum :

(*a*) Si la blessure a déterminé une incapacité complète de travail, une pension de 70 p.c. du salaire annuel ;

(*b*) Si la blessure a déterminé une incapacité partielle de travail, une pension :

de 50 p.c. si la victime n'est pas capable de gagner plus de un quart de son salaire quotidien moyen ;

de 10 à 40 p.c., suivant le degré d'incapacité, de son salaire quotidien moyen.

La pension prend cours le vingt-neuvième jour après l'accident. Elle est allouée aussi longtemps que l'incapacité subsiste au même degré. Elle peut être augmentée, réduite ou supprimée si l'incapacité de travail résultant de l'accident s'accroît, diminue ou prend fin. Elle sera, dans tous les cas, réduite de 25 p.c. dès que la victime atteindra l'âge de 55 ans.

Art. 21.—Tous les ans, la Commission centrale de la prévoyance déterminera pour l'année suivante et en se basant sur les chiffres de l'année précédente, le taux de la prime par franc de salaire et pour un coefficient de risque égal à l'unité.

Ces articles déterminent nettement la méthode de calcul des cotisations. Elle est identique à la méthode autrichienne. Si l'on examine cette dernière, on ne peut qu'exprimer des craintes quant à l'efficacité de son application.

En désignant par :

U_m, U_p, U_t les probabilités, rapportées à une durée d'un an, d'un accident entraînant la mort, l'invalidité permanente, ou l'invalidité temporaire, par ${}^{(m)}A_x$, ${}^{(p)}A_x$, ${}^{(t)}A_x$ la valeur, au début de l'année, des charges correspondantes envers un assuré d'âge x, en cas d'accident, la prime p_x, nécessaire pour garantir pendant un an un assuré d'âge x est :

$$p_x = U_m {}^{(m)}A_x + U_p {}^{(p)}A_x + U {}^{(t)}A_x.$$

À la vérité le problème ne se présente pas d'une façon aussi simple. Il est souvent malaisé de déterminer la valeur de U_m, U_p, U_t pour un établissement industriel en particulier. Aussi l'on peut se contenter de rechercher les probabilités d'accidents pour l'ensemble des industries, quitte à appliquer à chacune d'elles un coefficient de risque spécial.

Est-il besoin de faire remarquer que, s'il est possible de déterminer avec une rigueur suffisante les coefficients de risques, l'avenir financier des établissements d'assurance qui calculeraient les cotisations d'après la méthode que nous venons d'indiquer, serait réalisé. La loi de l'espérance mathématique ainsi observée, étançonnée par la loi des grands nombres en serait la garantie.

Mais ce n'est pas ainsi que l'on a procédé en Autriche. L'on s'est proposé d'unifier les cotisations pour des ouvriers d'âges différents auxquels seraient appliqués les mêmes coefficients de risques.

La méthode du calcul des cotisations d'après ce principe mérite d'être rapportée.

Si l'on désigne par C_1, C_2, C_3 les coefficients de risques, les cotisations par unité de salaire, pour les établissements affectés de ces coefficients, se calculent d'après les formules :

$$p_1 = KC_1 ; \; p_2 = KC_2 ; \; p_3 = KC_3 \ldots\ldots$$

K étant la cotisation correspondante à l'unité de salaire et à l'unité du coefficient de risques.

On a déterminé K par la méthode suivante : désignons par Q la cotisation moyenne par unité de salaire—

$$Q = \frac{p_1 s_1 + p_2 s_2 + \ldots\ldots}{s_1 + s_2} = \frac{\Sigma p_n s_n}{\Sigma s_n} = \frac{K \Sigma C_n s_n}{\Sigma s_n} \qquad (1)$$

par conséquent :

$$K = \frac{Q \Sigma s_n}{\Sigma C_n s_n}. \qquad (2)$$

La valeur de K dépend donc de la cotisation moyenne que l'on a calculée de la manière suivante : les valeurs de p_x étant données par la formule—

$$p_x = U_m {}^{(m)}A_x + U_p {}^{(p)}A_x + U_t {}^{(t)}A_x.$$

On a pris :

$$Q = \frac{\Sigma n_x p_x}{\Sigma n_x}. \qquad (3)$$

n_x étant le nombre d'assurés de l'âge x.

La méthode que nous venons d'exposer présente de graves défauts.

L'un des plus importants est que les formules qui précèdent présentent entre elles des contradictions. Alors que la cotisation moyenne donnée par la formule (1) est suffisante pour couvrir les risques d'accidents et payer les indemnités calculées d'après les salaires effectifs, la cotisation moyenne donnée par la formule (3) suppose tous les salaires égaux à l'unité. Il n'y a donc pas correspondance entre ces formules. La cotisation donnée par l'équation (3) n'est donc qu'approximative et il serait malaisé de déterminer le degré et le signe de cette approximation.

En second lieu, on ne peut que s'élever contre cette introduction, tout au moins inutile, de la déplorable idée des moyennes dans l'application de la loi. Il y a là comme un relent de ces notions défectueuses d'assuré moyen, d'accident moyen dont les conséquences peuvent être considérables.

En effet, peut-on affirmer, que les prévisions quant aux taux des salaires d'après lesquelles on établit la cotisation moyenne se réaliseront ? Quelle est alors la valeur de cette cotisation, ainsi soumise à toutes les fluctuations du marché industriel ? C'est là une source de mécomptes dont on ne peut prévoir l'importance.

D'autre part, la subdivision en établissements d'assurance est opposée à la cotisation moyenne. Pour que celle-ci fût applicable à tous les établissements d'assurance, il faudrait que leur population assurée fût répartie de la même manière par catégories d'âges et de salaires. Ces conditions nécessaires seront-elles réalisées ? Divers facteurs interviennent, dès le premier instant, pour rompre l'équilibre dans la répartition des affiliés entre les différentes institutions territoriales. La répartition initiale des assurés par âges, le coefficient d'augmentation de la population peuvent différer d'une contrée à l'autre. Ce sont là des causes de rupture d'équilibre, aggravées encore par les conditions du travail différentes suivant les districts, qui peuvent avoir un douloureux retentissement sur les finances des établissements d'assurance.

Du reste, ces phénomènes ont été constatés. L'Autriche en fait actuellement la dure expérience, traduite par les déficits constants des organes de l'assurance contre les accidents. En Allemagne, les conséquences de l'adoption d'une cotisation moyenne se sont fait sentir d'une façon intense : La situation des établissements d'assurance contre l'invalidité et la vieillesse révèle l'importance de cette cause perturbatrice, à tel point que pour obvier à ce danger, l'on a proposé un plan de réformes d'après lequel le capital des rentes à échoir serait réparti pour une partie entre tous les établissements. Moyen inefficace, on en conviendra, de corriger une erreur fondamentale.

Cependant l'on à prétendu que ce principe de la cotisation moyenne peut être admis si l'État, qui prend l'initiative de l'assurance obligatoire, se rend responsable des déficits. Pour notre part, nous ne croyons pas que l'on puisse arguer de la responsabilité financière de l'État pour justifier l'adoption d'un système empirique. Du reste, ainsi que M. Bégault l'a fait remarquer au dernier Congrès des Accidents du Travail, de récents exemples prouvent que cette garantie de l'État peut devenir illusoire.

En tout cas l'Autriche, commettant une erreur de principe, a été logique en supprimant l'assurance privée. En Belgique, l'avant projet

élaboré par la Commission du Conseil Supérieur du travail la maintenait. On peut se demander, jusqu'à quel point l'État peut avoir le droit d'imposer, par les nécessités d'une concurrence officielle, à des sociétés privées une méthode de calcul erronée qui peut leur être fatale.

Enfin, la cotisation par florin de salaire et par unité de coefficient de risques résulte de l'équation :

$$K = \frac{Q\Sigma s_n}{\Sigma C_n s_n}.$$

Si les variations du salaire dans chaque classe de risques ne sont pas proportionnelles, cette équation n'a plus aucune valeur.

Tels sont les griefs généraux que l'on peut opposer à la loi autrichienne. Tels sont aussi ceux que l'on peut formuler à l'égard de l'avant projet belge, dont l'article 21, que nous avons cité, implique la même solution mathématique.

Mais là ne se bornent pas les critiques qu'on peut lui adresser.

Les articles 6 et 7, de cet avant projet, en grand partie empruntés à la loi autrichienne, sont peu susceptibles d'être traduits en formules.

"Si dans cet ordre de choses, dit M. Adan,[1] nous envisageons la "probabilité de l'évènement dommageable, on constate qu'il exige entre "autres éléments, le dégagement :

"1°. De la probabilité de décès pour la cause spéciale, accidents du "travail ;

"2°. De la probabilité de mariage de l'ouvrier, attendu que l'ouvrier "célibataire aujourd'hui peut se marier demain ;

"3°. De la probabilité de survie de l'épouse, probabilité dont la "réalisation créera la veuve, probabilité à évaluer sans connaissance "préalable exacte des âges des époux à l'aide de moyennes ;

"4°. De la probabilité de géniture d'enfants légitimes et de survie "d'enfants de moins de quinze ans au moment du décès de l'ouvrier ;

"5°. De la probabilité de célibat et de décès de l'ouvrier en état de "célibat en délaissant des ascendants *indigents* soutenus *uniquement* par "lui, plus la probabilité de permanence de l'état d'indigence de ces "ascendants ;

"6°. De la probabilité de remariage de la veuve ;

"7°. De la probabilité de procréation d'enfants illégitimes d'ouvriers.

"En admettant que l'observation puisse conduire à l'élaboration "d'une table parfaite accusant l'intensité de production de décès par la "cause spéciale, accident du travail, par âge et par catégorie de travail, "on aurait franchi un premier pas de difficultés ; mais on se trouvera en "seconde ligne en présence d'un ordre de faits de nature toute différente, "de complexion fort composée, ceux qui sont visés sous le No. 2 "et 4 à 7 ci-dessus, en ce sens qu'ils dépendent du libre arbitre de "l'homme."

On s'est trouvé, en Autriche, aux prises avec ces difficultés. À défaut de les surmonter on a tenté de les tourner. Qu'on nous permette afin de préciser ce point d'ajouter aux considérations de M. Adan, celles que nous présentions nous-même au Congrès des Accidents du Travail :

"Je voudrais ici vous faire toucher du doigt toute l'erreur de la loi "autrichienne en ce qui concerne l'établissement de la prime dans cette "hypothèse erronée de la cotisation moyenne. Je voudrais vous montrer

[1] Rapport présenté en 1897 au Congrès des Accidents du Travail.

" cet alliage bizarre de tables statistiques informes et parfois modifiées " pour les besoins de la cause ; probabilités d'accidents résultant du " fonctionnement de l'assurance en Allemagne, table de mortalité " allemande, probabilités de mariage déduites de l'observation de la " population autrichienne, probabilités de délaisser des enfants de moins " de quinze ans, déduites de la combinaison de la table de mortalité " allemande et des statistiques du chemin de fer Bergisch Märkisch, " enfin les nombres du recensement allemand de 1881, les chiffres autri- " chiens pour le montant des salaires, si bien que l'on peut se demander " comment on a pu trouver des techniciens pour affirmer que la " cotisation moyenne calculée sur des bases aussi incertaines, était " suffisament approchée."

Les mêmes difficultés, les mêmes incertitudes se seraient reproduites dans la mise en pratique de l'avant projet belge.

Dans le discours d'ouverture du Congrès de Bruxelles, M. le Ministre d'État Beernaert, signalant qu'au Conseil Supérieur du Travail, " après des débats longs et brillants, les combattants couchaient sur leurs positions " demandait aux actuaires, d'indiquer, au point de vue financier, le meilleur système d'assurances.

Ils ont répondu à cet appel. Ils ont signalé le danger de l'imitation des solutions défectueuses qui ont force légale en Allemagne et en Autriche.[1]

Sans doute, on a tenu compte de leurs avis, car un nouveau projet est à l'étude.

Force nous est, avant qu'il soit déposé de borner ici l'examen de la question de la réparation des accidents du travail en Belgique.

[1] Voir à ce sujet les rapports de MM. Adan, Marie et Maingie ; les discours de MM. Adan, Lepreux, Bégault, Cheysson et Maingie. "Rapports et Procès-verbaux des Séances du Congrès International des Accidents du Travail," 4e session. Bruxelles : Weissenbruch, 1897.

Translation.

Compensation for Workmen's Accidents in Belgium. *By* Louis Maingie, *Associate Actuary of the Belgian General Life Assurance Company, Fellow of the Association of Belgian Actuaries.*

The question of Compensation for Workmen's Accidents, discussed in Belgium for many years, has not yet been solved.

Nevertheless, stimulated by outside activity, the activity in the matter of social legislation has been as great in Belgium as in neighbouring countries. More than once, the regulations in force in Germany and in Austria for compensation for accidents to workmen have attracted the attention of the legislator, have inspired many writings and many draft Bills.

To-day, now that the problem has passed, with some variations, through the same phases as in the countries where it has been solved, now that it would seem that the adoption of a definite solution cannot be delayed, the major part of these writings, of these draft Bills, is hardly of more than historic interest.*

From the point of view of the propriety of social legislation on workmen's accidents, the proposals put forward for discussion in Belgium at the instigation of the Government are based upon the principle that employers' liability takes its rise from the labour contract.

This latter way of viewing the question was adopted by a Commission nominated in 1890 by the Minister of Justice, the labours of which have become obsolete, in this sense that the question has since then been again taken up with the purpose of making new proposals.

It is thus that on 26 November 1896, M. Nyssens, Minister of Trade and of Labour, brought forward a Bill on the labour contract, regarding which his explanations in his Report to Parliament were very explicit on the question of principle :—"One of the most "important questions", it is therein said, "connected with the labour "contract of workmen, is that of compensation for accidents. The "Bill in this respect only affirms the principle generally admitted at "the present day, namely, that the liability of the employer is based "upon the contract itself, which obliges him, like a good father of a "family, to see that the work is carried on under suitable conditions "of healthiness and safety.

* In the excellent work of M. M. Bellom, *Workmen's Assurance Laws in Foreign Countries*, vol. ii., pp. 931 and seq., will be found information as to the history of compensation for workmen's accidents in Belgium.

" Examples drawn from other sources have forced upon foreign " legislators, and are urging on Belgian legislators, more complete " remedies in the social problem of compensation for workmen's " accidents. This matter, which has just been considered by the " Upper Council on Labour, should in our opinion be the object of a " special law, supplementary to the law on labour contracts."

This point being admitted, the problem remains subject to all kinds of differences of opinion.

Important discussions have arisen regarding proposals brought forward either by Government, or by economists, or by syndical associations. We shall not consider the systems proposed outside of Government initiative, the greater number of these having no chance of being adopted on account of their having no solid basis. It need only be said that to the labour contract every type of solution has been applied. People have been influenced principally by the legislation in force in Germany and in Austria, on the plea that an experience extending over several years is worthy of confidence.

The organization of the German Corporations has had many partizans, who, in urging imitation, have relied on the same arguments which have led the German traders to defend the financial system of assessment. Nevertheless, seeing that the Congress on Labour Accidents, held in Brussels in 1897, has given the opportunity of showing especially from the actuarial point of view, the evils of this system, and of pointing out the fears to which it gives rise for the future, it is to be hoped that the partizans of this scheme will not have the influence necessary to carry it.

On the other hand, the attention of legislators has been for the most part concentrated on the Austrian solution. A Bill drafted on its broad lines has been submitted to the Upper Council on Labour.

Although it is not likely to become the subject of a Parliamentary debate, it is worthy of notice, because it shows, both in itself and in the discussions to which it has given rise, what was the position of its moving spirits, and the tendencies in certain quarters at a quite recent date.

A sketch, prepared by the Department of the Minister of Labour, was, on 9 November 1896, addressed by the Minister, M. Nyssens, to the Commission of the Upper Council on Labour which was appointed to enquire into Compensation for Accidents.

" I say purposely a sketch," remarked the Minister in the covering letter. " There is in question here not a Bill, nor even the draft of a " Bill, from which it might be inferred that the Government leaned " towards such or such a resolution of the multifarious problems raised " by the question of labour accidents."

These words show that if there were tendencies exhibited towards the Austrian system, the Government, while viewing them favorably, was not irrevocably committed to them.

The sketch included two plans, of which the first, A, applicable to the great trades, stipulated for compulsion. The second, B, was applicable to the trades not provided for in the first, but left assurance optional.

The above-mentioned plan A is, moreover, the only one of interest, because there was the provision that the minor trades coming under plan B could be made subject to compulsory assurance.

In addition to the obligation to assure, the above-mentioned plan A stipulated that the Assurer should take the form of Provident Funds for Assurance against Accidents, a description of mutual arrangement between the employers and their workmen.

This project, somewhat draconian, prepared by the Department of the Minister of Labour, and which on this account was thought to be inspired by the Government, did not fail to provoke violent objections. During the discussions in the Commission of the Upper Council on Labour, a somewhat large minority separated themselves sharply from the majority on the question of the obligation of the assurer. Outside of that Commission several critical works, the most notable of which is that of M. Adan,* were published. It is not our intention to repeat in connection with this Draft Bill the differences of opinion which it created, the discussions to which it gave rise, the criticisms to which it was subjected. It is, however, not useless to record, in order to indicate the various tendencies, that these criticisms had been passed, and that if the Bill had many partizans, it raised in other quarters opposition, sometimes violent, and in any case sufficiently vigorous to cause the question to be referred back for further enquiry.

We might here close this examination. But nevertheless it appears to us to be necessary, in a gathering of actuaries, to explain the position assumed by Belgian actuaries in relation to a question where it seems that their advice was not despised.

As M. Adan said in his remarkable paper read at the last Congress on Labour Accidents:—"If the force of circumstances leads the "Actuary to offer his advice on a technical matter involved with "politics, he nevertheless does not make a compromise in the domain "of science. He is careful to leave to the legislator alone the "responsibility for the conscientious effort which the latter makes "towards a scientific solution, after having enlightened him in this "effort with all due deference, but with all the firmness which it is his "duty to display."

Inspired by these considerations the Belgian actuaries formulated sundry objections to the Draft Bill, and expressed their doubts.

For the same reasons we may be permitted to reproduce here these doubts and objections.

As a preliminary, a few explanations are required.

The clauses which define the mathematical groundwork of the Belgian project are as follows:—

ART. 6. If the accident results in the death of the victim, the compensation shall consist of—

1. A sum of 50 francs for funeral expenses;
2. An annuity of 20 per-cent of the yearly wages to the widow of the victim until her death or re-marriage;
3. An annuity of 10 per-cent to each legitimate child until 15 years of age, if the married partner of the victim be alive, or 15 per-cent should she be dead, or should she die;
4. If the victim was a married woman, an annuity of 20 per-cent to the husband, if he be unable to provide for his own needs, during the existence of such incapacity;

* On the new Draft Bill on Compensation for Workmen's Accidents in Belgium. By H. F. G. Adan, Brussels, Lesigne, 1897.

5. If the victim was unmarried, or if the annuities mentioned above under headings 2 and 3, or 3 and 4, do not amount to 50 per-cent, an annuity of 20 per-cent at the outside to the progenitors of whom the victim was the sole support, for their lives or until they are no longer in want.

The total amount of the annuities to the partner, to the children, and, should the cases occur, to the progenitors, must not exceed 50 per-cent; in case of excess, the annuities must be proportionately reduced. Nevertheless the partner and the children take precedence of the progenitors. These are entitled to the balance up to 50 per-cent after the annuities have been provided for the partner and the children.

Parents take precedence of grandparents.

Acknowledged illegitimate children have the right to compensation like legitimate children.

The widow who re-marries loses all right to the annuity, but receives as final compensation 20 per-cent of the annual wages of the victim.

Art. 7. If the accident result in injury which renders the victim incapable of performing his usual work, the compensation shall consist of:—

1. Medical attendance and medicine from the day of the accident up to the end of the sixth week, unless the victim be previously restored to health;
2. Assistance, equal to half the average daily wages, per day, from the fifteenth to the twenty-eighth day after the accident, unless the victim be previously restored to health;
3. Supplementary aid equal to three times the average daily wages, if the victim be not restored to health by the twenty-eighth day.

The compensation comprises besides, as a minimum,

(*a*) If the injury produces total incapacity to work, an annuity of 70 per-cent of the average annual wages;

(*b*) If the injury produces partial incapacity to work, an annuity of
50 per-cent if the victim be not able to earn more than one-fourth of his average daily wages;
10 per-cent to 40 per-cent, according to the degree of incapacity, of the average daily wages.

The annuity commences to run on the twenty-ninth day after the accident. It is payable as long as the incapacity exists to the same degree. It may be increased, reduced, or extinguished, if the incapacity to work resulting from the accident increases, diminishes, or ceases. It will in all cases be diminished by 25 per-cent when the victim attains the age of 55 years.

Art. 21. Each year the Central Commission for Thrift shall fix for the next year, and taking as a guide the figures of the preceding year, the rate of premium per franc of wages, and for a coefficient of risk equal to unity.

These clauses set forth exactly the method of calculating the contributions. It is identical with the Austrian method. If this latter be examined, we can express only doubts as to its being capable of efficient application.

Representing by V_m, V_p, V_t, the probabilities, having reference to the term of one year, of an accident causing death, permanent disablement, or temporary disablement; by ${}^{(m)}A_x$, ${}^{(p)}A_x$, ${}^{(t)}A_x$, the values at the beginning of the year, of the corresponding benefits to an assured aged x, in case of accident; the premium, p_x, requisite to protect for one year an assured aged x, is

$$p_x = V_m\,{}^{(m)}A_x + V_p\,{}^{(p)}A_x + V_t\,{}^{(t)}A_x.$$

In practice the problem does not appear in a form so simple. It is often not easy to determine the values of V_m, V_p, V_t for a particular industrial trade. Therefore we must content ourselves with finding the probabilities of accident for trades as a whole, provided that we multiply each of them by a coefficient of special risk.

It is scarcely necessary to remark that, were it possible to determine with sufficient exactitude the coefficients of risk, the financial future of such assurance institutions as calculated their rates by the method explained would be secured. The law of mathematical expectation thus followed, supported by the law of large numbers, would be the guarantee.

But it is not thus that they have acted in Austria. There it has been proposed to assimilate the rates of contribution for workmen of different ages, to whom would be applied the same coefficients of risk.

The method of calculating the rates of contribution according to this principle is worthy of record.

If we represent by C_1, C_2, C_3, the coefficients of risk, the rate of contribution per unit of wages for trades affected by these coefficients are found by the formula—

$$p_1 = KC_1;\ p_2 = KC_2;\ p_3 = KC_3 \ldots.$$

K being the rate of contribution for a unit of wages, with unity for the coefficient of risk.

K was found as follows:—Let Q be the average rate per unit of wages.

$$Q^* = \frac{p_1 s_1 + p_2 s_2 + \&c.}{s_1 + s_2 + \&c.} = \frac{\Sigma p_n s_n}{\Sigma s_n} = \frac{K\Sigma C_n s_n}{\Sigma s_n} \quad \ldots\ldots (1)$$

Therefore—

$$K = \frac{Q\Sigma s_n}{\Sigma C_n s_n} \quad \ldots\ldots (2)$$

The value of K thus depends on the average rate of contribution, which was calculated as below; the values of p_x being given by the formula—

$$p_x = V_m\,{}^{(m)}A_x + V_p\,{}^{(p)}A_x + V_t\,{}^{(t)}A_x$$

It was assumed that—

$$Q = \frac{\Sigma n_x p_x}{\Sigma n_x} \quad \ldots\ldots (3)$$

n_x being the number of assured, aged$_x$.

* s representing the wages (French, *salaire*).—Ed.

The method just set forth possesses serious defects.

One of the most important is that the foregoing formulas are inconsistent with each other. While the average rate of contribution given by formula (1) is sufficient to cover the risk of accidents, and pay the compensation calculated on the effective wages, the average rate of contribution given by formula (3) assumes all the wages to be equal to unity. There is therefore no relationship between these formulas. The rate of contribution given by formula (3) is therefore only approximate, and it would be difficult to determine the degree and sign of approximation.

In the second place, we cannot but protest against the entirely needless introduction of the deplorable idea of average in the application of the law. It is like the resuscitation of the defective notion of an "average assured", an "average accident", of which the consequences may be considerable.

In fact, can it be affirmed that the forecasts as to the rates of wages on which the average rates of contribution are based will be realized? What, then, is the value of these rates of contribution thus subject to all the fluctuations of industrial progress? Here is a source of miscalculation of which it is impossible to predict the magnitude.

Moreover, the distribution of the assurances over different organizations is incompatible with an average rate of contribution. In order that this latter should apply to all the assurance organizations, it would be necessary that their assured membership should be distributed in the same proportions as regards age and wages. Will these essential conditions be realized? Sundry factors intervene from the very outset, to disturb equilibrium in the distribution of membership between the different district organizations. The initial age distribution of the assured, the coefficient of increase of the population, may differ between one province and another. These are causes which will disturb equilibrium, aggravated again by the varying conditions of labour according to locality, which may have a disastrous effect on the finances of the assurance organizations.

Moreover, these phenomena have been undeniably established. Austria has suffered a hard experience, due to the constant deficits of the organizations for assurance against accident. In Germany the consequences of the adoption of an average rate of contribution have made themselves felt to an intense degree. The position of the organizations for assurance against disablement and old age reveal the magnitude of this disturbing element to such an extent that, to obviate the danger, a scheme of reform has been proposed under which the accumulations for annuities not yet come into possession would be distributed in part among all the organizations. An inadequate plan, it will be admitted, to correct a fundamental error.

Nevertheless, it has been asserted that the principle of an average rate of contribution may be adopted, if the State, which imposes compulsory assurance, assumes the liability for the deficits. For our part we do not think it legitimate to put forward the argument of the financial stability of the State in order to justify the adoption of an empirical system. Moreover, as M. Bégault said at the last Congress on Labour Accidents, recent examples show that the guarantee of the State may be illusory.

In any case, Austria, perpetrating an error of principle, has been logical in eliminating private assurance. In Belgium the draft Bill proposed by the Commission of the Upper Council on Labour retained it. It may be asked, up to what point has the State the right to impose on private associations, by the exigencies of official competition, an erroneous method of calculation which may be very disastrous.

Lastly, the contribution per florin of wages and per unit of coefficient of risk, is derived from the equation

$$K = \frac{Q\Sigma s_n}{\Sigma C_n s_n}$$

If the variations of wages in each class of risks are not proportionate, this equation has no longer any meaning.

Such are the general objections that may be urged against the Austrian law. Such are also those that may be raised with regard to the Belgian Draft Bill, Art. 21 of which, quoted above, implies the same mathematical solution.

But this does not end the criticisms which may be passed upon it.

Arts. 6 and 7 of the Draft Bill, for the most part borrowed from the Austrian law, are hardly capable of translation into formulas.

"If under this state of things", says Mr. Adan,* "we examine "the probability of the event for which compensation is payable, we "shall find that among other elements we shall require to ascertain:—

"1. The probability of death from a special cause, labour "accident;

"2. The probability of marriage of the workman, remembering "that the workman, to-day a bachelor, may marry to-morrow;

"3. The probability of survival of the wife, the happening of "which event will create a widow; a probability to be "estimated by averages, in the absence of previous certain "knowledge of the ages of husband and wife;

"4. The probability of the birth of legitimate children, and of the "survival of children of less than 15 years of age at the time "of the death of the workman;

"5. The probability of bachelorhood, and of the death of the "workman in the state of bachelorhood, leaving *indigent* "progenitors supported *wholely* by him; and further the "probability of the continuance of the state of indigence "of these progenitors;

"6. The probability of re-marriage of the widow;

"7. The probability of the birth of illegitimate children to the "workman.

"It may be admitted that, by observation, a perfect table might "be constructed to give the rate of mortality from the special cause, "labour accident, according to age and according to description of "trade, and that thus the first stage of the difficulty might be "surmounted; but then we should only arrive at the second stage, "where we should encounter an order of events totally different, of a "very complex nature, those included in Nos. 2 and 4 to 7 above, "complex in that they depend on the free action of the human will."

In Austria they find themselves face to face with these difficulties.

* Paper submitted in 1897 to the Congress on Labour Accidents.

Failing to surmount them, they have tried to get round them. I may be permitted, in order to bring out this point clearly, to add to the remarks of M. Adan, some that I myself offered at the Congress on Labour Accidents.

"I should like here to place the finger on the full mistake in the "Austrian law as regards the calculation of the premium on the "erroneous hypothesis of an average rate of contribution. I should like "to show you the strange mess of shapeless statistics, sometimes "altered according to the needs of the case; probabilities of accident "deduced from assurance operations in Germany; German table of "mortality; probabilities of marriage deduced from observations on "the Austrian population; probabilities of leaving children under "15 years of age, deduced from a combination of the German mortality "table with statistics of the Bergisch Märkisch Railway; lastly, the "enumerations of the German census of 1881, and Austrian figures "for the amount of wages. It may well be asked how it was possible "to find experts who would certify that the average rate of contri-"bution calculated on a basis so uncertain was ascertained with "sufficient closeness."

The same difficulties, the same uncertainties, would have been reproduced by the adoption of the Belgian Draft Bill.

In his opening address at the Brussels Congress, M. Beernaert, Minister of State, declaring that, at the Upper Council on Labour, the combatants, after long and brilliant debates, had held their respective positions, asked the actuaries to say from the financial point of view, what is the best system of assurance.

These have responded to that appeal. They have demonstrated the danger of copying the defective solutions which have legal sanction in Germany and in Austria.*

Doubtless their advice has had weight, because a new plan is under consideration.

We are under constraint to conclude here our examination of the question of Compensation for Workmen's Accidents in Belgium.

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* See on this subject the papers of MM. Adan, Marie and Maingie; the speeches of MM. Adan, Leprenx, Bégault, Cheysson and Maingie. "Transactions and Minutes of the International Congress on Labour Accidents", 4th session, Brussels, Weissenbruch, 1897.

Etat actuel de la Question des Accidents du Travail en France

Par LOUIS WEBER,
Actuaire de l'Office du Travail, Membre agrégé de l'Institut des Actuaires Français.

La loi sur la responsabilité patronale, promulguée le 9 avril dernier, clôt la longue période d'études et de discussions à laquelle a donné lieu en France la question des accidents du travail, depuis l'époque déjà lointaine (1880) où une première proposition relative à la matière avait été déposée par M. Martin Nadaud, député.

Dès 1887, la Chambre adopta un projet de sa commission, qui substituait aux règles générales des articles 1382 et 1383 du Code Civil le principe du risque professionnel et, comme conséquence, la nécessité de l'assurance. Le Sénat modifia la solution proposée par la Chambre, mais en maintenant toutefois le principe du risque professionnel. La législature suivante de la Chambre reprit le travail à ce point précis, le risque professionnel étant désormais admis. Un projet déposé en 1890 par M. Jules Roche, Ministre du Commerce, et qui instituait l'assurance obligatoire, devint la base sur laquelle la Commission du travail, présidée par M. Ricard, élabora un nouveau texte très complet et profondément étudié qui organisait l'assurance obligatoire par des mutualités régionales analogues à celles qui fonctionnent en Autriche, depuis 1889, conformément à la loi du 28 décembre 1887. Après adoption par la Chambre, á la majorité de 493 voix contre 4, le 10 juin 1893, ce projet fut renvoyé au Sénat. Par l'organe de son rapporteur, M. Poirrier, la commission sénatoriale rejeta le principe de l'assurance obligatoire, mais proclama cependant la nécessité d'une garantie spéciale des indemnités dues aux victimes d'accident et à leurs ayant-droits.

A partir de cette époque, de nombreux échanges de vues eurent lieu entre les deux assemblées afin d'établir un terrain d'entente. Les idées d'obligation dominant à la Chambre, celles, au contraire, de la plus grande liberté possible, compatible avec une garantie donnée aux ouvriers, prévalant au Sénat, il semblait difficile d'aboutir à un accord. C'est ainsi que le projet voté en janvier 1896 par le Sénat, s'écartant de plus en plus du projet initial de la Chambre, allait jusqu'à laisser

l'indemnité due en cas d'accident flotter entre les limites d'un maximum et d'un minimum, et n'instituait aucune garantie obligatoire, en dehors de celle fournie par le privilège actuel du Code Civil (arts. 2,101 et 2,102). La commission de la Chambre chargée d'examiner ce projet ne put, de son côté, se résoudre à abandonner entièrement le principe de l'obligation de l'assurance, et revint, d'autre part, à la fixation d'un chiffre uniforme pour l'indemnité. Le texte présenté le 7 juillet 1897 par M. Maruéjouls, rapporteur, rétablit, en effet, l'obligation de l'assurance mais en la limitant à des mutualités instituées d'office entre les patrons qui n'auraient pas voulu fournir, individuellement ou réunis en syndicats, certains cautionnements dont le montant devait être déterminé ultérieurement par un règlement d'administration publique. En ce qui concerne les indemnités, le projet Maruéjouls adoptait, à peu de chose près, les taux proposés déjà en 1893 par M. Ricard. Il semblait encore impossible, sur ces bases, d'arriver à un accord avec le Sénat. C'est alors que le Gouvernement et la Commission s'inspirèrent heureusement d'une idée nouvelle : la garantie par l'État des insolvabilités des chefs d'entreprise au moyen d'un impôt additionnel aux patentes supporté par l'ensemble des industriels.

Cette garantie de l'insolvabilité éventuelle des patrons imprévoyants par un impôt général de rendement certain, avait le grand avantage de rendre inutile désormais l'obligation de l'assurance et de permettre ainsi d'espérer une entente avec le Sénat. Au mois de janvier 1898, la Chambre vota le projet remanié de la sorte, qui, en retournant aussitôt après au Sénat, ne devait plus rencontrer la même opposition de la part de la haute assemblée. Dans son rapport, en effet, la Commission sénatoriale, par l'organe de M. Thévenet, acceptait le principe de l'impôt de garantie et la seule modification importante qu'elle introduisait consistait à supprimer l'exigibilité du capital des rentes à servir aux victimes d'accident ou à leurs ayant-droits, qui avait été stipulée dans le projet de la Chambre. La discussion au Sénat fit l'objet de deux délibérations dans l'intervalle desquelles le texte proposé subit encore quelques remaniements et fut définitivement voté en deuxième lecture le 19 mars 1898. Le 26 mars suivant, la Chambre adoptait, sans discussion et après déclaration d'urgence, le même texte qui prenait ainsi force de loi.

La loi nouvelle s'étend aux travailleurs et employés des fabriques, du bâtiment, des mines et des carrières, des entrepôts, des entreprises de transport, et, en général de toutes les exploitations où il est fait usage d'engins mécaniques. Elle institue à leur profit un régime différent de celui de l'art. 1,382 du Code Civil.[1] Pour ces ouvriers et employés, et jusqu'à concurrence d'un salaire de 2,400 francs (pour le surplus le salaire n'intervient que pour un quart) elle substitue au régime de l'indemnité éventuelle, fixée au gré des tribunaux, une indemnité certaine, variant suivant la gravité de l'accident, et ayant le caractère forfaitaire. Les taux d'indemnité, en cas de mort, d'incapacité permanente, totale ou partielle, et d'incapacité temporaire, sont sensiblement les mêmes qu'en Allemagne et en Autriche, avec cette différence toutefois que la rente d'incapacité partielle est calculée sur la moitié seulement de la réduction de salaire subie et non sur la totalité de cette réduction.

[1] Cet article est ainsi conçu : "Tout fait quelconque de l'homme, qui cause à autrui " un dommage, oblige celui par la faute duquel il arrive, à le réparer."

L'assurance-maladie n'étant pas obligatoire, comme elle l'est en Allemagne et en Autriche, il a fallu assurer la réparation de tous les accidents de courte durée, qui, dans ces pays, sont indemnisés par les caisses de maladie. À cet effet, l'incapacité temporaire de travail donne droit à une indemnité et aux soins médicaux à partir du cinquième jour.

Le caractère forfaitaire de l'indemnité, conséquence du risque professionel, a pour effet de supprimer en principe toute distinction entre les accidents d'après le degré de responsabilité encourue soit par le patron, soit par la victime. Aussi la loi n'admet-elle de diminution de l'indemnité prévue qu'en cas de faute *inexcusable* de la victime; elle la supprime dans le seul cas de faute intentionnelle. Quant à la responsabilité patronale, lorsqu'il est prouvé qu'il y a eu faute inexcusable, elle peut être aggravée et les rentes attribuées aux victimes peuvent être dans ce cas majorées jusqu'à concurrence du salaire annuel.

La loi organise la constatation des accidents; elle simplifie la procédure, sans créer aucune juridiction arbitrale analogue aux tribunaux allemands. Aucune assurance obligatoire n'est instituée. En ce qui concerne les mesures à prendre en vue de s'acquitter de leur dette, la loi laisse aux chefs d'entreprise une liberté complète. Pour les rentes viagères à servir aux blessés frappés d'incapacité permanente de travail ou aux ayant-droits des ouvriers tués, elle n'astreint même pas les industriels débiteurs à verser le capital de ces rentes, il suffit qu'ils s'acquittent du paiement des arrérages au fur et à mesure de leur échéance (les rentes devront être payées par fractions trimestrielles).

À défaut d'assurance obligatoire, le paiement des indemnités est néanmoins garanti par l'État de la manière suivante:

Un fonds spécial de garantie est constitué, et la gestion en est confiée à une institution d'État déjà existante, la *Caisse Nationale des Retraites pour la Vieillesse*. Ce fonds est alimenté par le prélèvement annuel de centimes additionnels à l'impôt des patentes, supporté par toutes les entreprises visées par la loi. En cas d'insolvabilité des chefs d'entreprise débiteurs, la Caisse Nationale intervient et paie les rentes aux intéressés, en puisant les sommes correspondantes au fonds de garantie. Les titulaires de rentes n'ont donc pas à se préoccuper du recouvrement de leurs arrérages. Si le patron responsable ne les paie pas, c'est la Caisse Nationale qui les leur versera et qui, dès lors, se substituera à eux dans la récupération de la dépense qu'elle aura supportée de ce fait. Elle exercera directement un recours contre les débiteurs. Cette circonstance se présentera seulement lorsque l'industriel ne sera pas assuré auprès d'une compagnie ou d'une société mutuelle. Dans le cas contraire, la Caisse Nationale n'aura à intervenir que si la compagnie ou la société d'assurance fait faillite; elle paiera de même alors les rentes et exercera son recours contre l'assureur. Le fait d'être assuré dégage ainsi l'industriel de toute responsabilité. L'impôt à l'aide duquel sera formé le fonds de garantie est peu élevé. Par conséquent la sécurité du mécanisme que nous venons de décrire dépendra en première ligne de la sécurité même qu'offriront les sociétés d'assurance. Ainsi la nécessité s'impose-t-elle de soumettre ces organes à une surveillance rigoureuse. La loi prévoit cette surveillance; elle stipule l'obligation pour les sociétés de constituer

des réserves. Le détail du contrôle de l'État, ainsi que les conditions dans lesquelles seront constituées les réserves, doivent être déterminés ultérieurement par un règlement d'administration publique actuellement en voie d'élaboration.

Telles sont les principales dispositions de la nouvelle loi rançaise. Entre la solution étatiste de l'assurance obligatoire qui a prévalu en Allemagne, en Autriche et en Norvège, et la simple modification du régime de la responsabilité civile, à laquelle se sont bornés les législateurs anglais et danois, elle apporte une solution intermédiaire et concilie heurensement les deux courants d'idées opposées du socialisme d'État et du libéralisme individualiste.

L'originalité de cette loi consiste principalement dans la garantie des indemnités en dehors de tout assujetissement. D'ailleurs, elle ne fait que dissimuler l'obligation de l'assurance. Car le recours de l'État, en cas d'insolvabilité éventuelle, sera une menace perpétuellement suspendue sur la tête de ceux qui n'auront pas jugé à propos de s'assurer, et il s'en suit que tout le monde s'assurera. Comme on l'a dit, sans instituer l'assurance obligatoire, cette loi institue " l'assurance obligée," ce qui, pratiquement, revient au même.

Quelles vont être les conséquences du nouveau régime ? Son premier effet sera de développer, dans des proportions inconnues jusqu'ici, l'industrie privée de l'assurance-accidents. Les compagnies à primes fixes, qui fonctionnent en France, devront refondre leurs tarifs et modifier les conditions de leurs polices de manière à les mettre en harmonie avec les dispositions de la loi. Les indemnités qu'elles garantissent actuellement aux assurés des polices collectives sont, en moyenne, le tiers seulement de celles qui reviendront désormais de droit aux victimes. Si les compagnies voulaient continuer à vendre l'assurance au même prix, elles devraient, en conséquence, tripler leurs primes, qui sont déjà, comparativement aux indemnités assurées en échange, très-élevées. Il est douteux qu'elles le fassent, car elles auront à lutter contre la concurrence grandissante des caisses mutuelles syndicales qui vont se multiplier parmi la grande et la moyenne industrie. L'assurance-accidents, en se généralisant et en devenant une nécessité, deviendra donc moins chère. Il est, d'ailleurs, à prévoir que la loi sera complétée par la réorganisation de notre *Caisse Nationale d'Accidents*.

Cette institution, créée il y a trente ans, est en effet loin d'avoir prospéré comme sa voisine la *Caisse Nationale des Retraites*. Les conditions aux quelles elle offrait l'assurance collective ne convenaient pas au public, et elle n'est jamais parvenue à attirer seulement la millième partie de la clientèle que se partagent, en France, les compagnies à primes fixes. Une réforme s'impose donc à cet égard, et il est à souhaiter que la Caisse Nationale, adaptée aux exigences nouvelles, entre en concurrence sérieuse avec les enterprises privées, et joue ainsi le rôle de modérateur pour empêcher tout renchérissement de l'assurance.

Évaluations statistiques.— On peut évaluer à 4 millions le nombre des ouvriers qui bénéficieront de la loi. Si l'on prend pour base le salaire moyen de 1,000 francs, et si l'on applique à l'industrie française les proportions moyennes d'accidents constatées en Allemagne, on trouve que les dépenses annuelles pour les accidents se monteront, au

régime permanent, c'est-à-dire au bout de 70 ans environ, à 125 millions de francs. Cette somme représente les indemnités et les arrérages des pensions en cours. En réalité, comme les industriels seront tous assurés et paieront des primes annuelles constantes, ce n'est pas cette somme qui représente la charge effective de l'industrie. Pour évaluer cette charge, il faut supposer appliqué le système de la capitalisation, car les sociétés d'assurance, devant avoir en réserve les capitaux constitutifs des pensions, devront recevoir, chaque année, dès l'origine, une prime globale égale aux indemnités temporaires échues et aux capitaux des rentes constituées dans l'année. Cette prime globale se monte à 76 millions environ, dans l'hypothèse d'un intérêt de placement égal à 3% et, en adoptant, pour loi de survie des blessés, la table de mortalité qui sert de base en Autriche aux calculs des capitaux de pensions de blessés, et pour loi de survie des veuves, des orphelins et des ascendants, la table de la Caisse Nationale des Retraites.

La prime globale de 76 millions correspond uniquement aux dépenses occasionnées par la réparation des accidents. Il faut y ajouter le montant des frais de gestion des organes divers d'assurance, qui, avec les hypothèses les plus favorables, ne peut guère être évalué à moins de 20% des dépenses afférentes aux accidents seuls. La charge annuelle de l'industrie se montera par conséquent à près de 100 millions. Il y a lieu d'estimer qu'elle ne descendra pas au-dessous de 90 millions.

A l'époque du régime permanent, les pensions seront servies, en partie sur les primes courantes, en partie sur le revenu des fonds accumulés dans les caisses des sociétés anonymes et mutuelles de toutes sortes. Les capitaux nécessaires alors au service régulier des pensions s'élèveront, dans les hypothèses adoptées ci-dessus, à 1,700,000,000 francs environ. Ils dépasseront même ce chiffre, si, comme il est à craindre, le taux de l'intérêt va encore en baissant.

En présence d'un capital aussi considérable, il convient de se demander quel en sera l'emploi, et si la loi ménage à l'industrie la possibilité de le conserver par devers elle et d'en tirer directement parti. Bien que la loi ne prévoie aucune assurance d'État et ainsi ne préjuge en rien sur la question des fonds affectés au service des pensions, il est hors de doute que la règlementation des sociétés d'assurance ne leur laissera pas sur ce point une grande latitude. Peu importe que le portefeuille des réserves soit entre les mains de l'État ou soit confié à des entreprises privées, la sécurité de la garantie ne saurait permettre à ces dernières des placements aventureux. Les placements autorisés seront donc très vraisemblablement les mêmes que les placements actuels des compagnies d'assurances sur la vie, et il est probable qu'ils se porteront de préférence sur les immeubles, qui fournissent actuellement un revenu supérieur aux fonds d'État et aux autres valeurs de tout repos. De toutes façons, et malgré la liberté laissée en ce qui concerne le mode d'assurance, la nouvelle loi entraînera l'immobilisation de capitaux pour une somme de plus d'un milliard et demi, et qui, par la force des choses, échapperont à l'industrie.

L'impôt destiné à alimenter le fonds de garantie est peu élevé. Les centimes additionnels produiront chaque année environ 750,000 francs, c'est-à-dire 1% de la prime pure globale. D'après les statistiques, on est à même de prévoir que les insolvabilités annuelles

n'atteindront pas 1% des charges correspondantes. L'impôt de garantie, tel qu'il est fixé pour les premières années d'application de la loi, paraît donc devoir être largement suffisant. Aux termes de la loi, il est, d'ailleurs, susceptible de modification et pourra être, soit diminué, soit augmenté, si besoin en était.

Translation.

On the Present Position of the Question of Labour Accidents in France. *By* Louis Weber, *Actuary to the Office of Labour, Fellow of the Institute of French Actuaries.*

The law on Employers' Liability, issued on 9 April last, brings to an end the long period of enquiry and discussion which had its origin in France from the question of Labour Accidents, in the time already long past (1880), when the first proposal on the subject was brought forward by M. Martin Nadaud, Deputy.

In 1887, the Chamber passed a Bill of its Committee, which substituted for the general regulations of Arts. 1382 and 1383 of the Civil Code, the principle of trade risk, and, as a consequence, the necessity for assurance. The Senate amended the scheme proposed by the Chamber, while nevertheless maintaining the principle of trade risk. In the next session of the Chamber, the work was again taken up exactly at this point, trade risk being from that time admitted. A Bill brought forward in 1890 by M. Jules Roche, Minister for Commerce, and which originated compulsory assurance, became the basis on which the Commission on Labour, presided over by M. Ricard, elaborated a new scheme, very complete and thoroughly thought out, which organized compulsory assurance by means of district mutual associations analogous to those which have been in operation in Austria since 1889, under the law of 28 December 1887. After being passed by the Chamber by the majority of 493 to 4, on 10 June 1893 this Bill was sent up to the Senate. By its Reporter, M. Poirrier, the Committee of the Senate rejected the principle of compulsory assurance, but laid down, nevertheless, the necessity for a special guarantee of the compensation payable to the victims of accidents and to their representatives.

Dating from this period, many conferences took place between the two Houses with a view to find a common ground of agreement. The idea of compulsion prevailing in the Chamber, and that, on the other hand, of the greatest possible freedom compatible with a guarantee to the workmen, being held by the Senate, it seemed difficult to arrive at an understanding. It is thus that the Bill passed in

January 1896 by the Senate, diverging more and more from the original proposal of the Chamber, went so far as to leave the compensation payable in case of an accident uncertain between maximum and minimum limits, and provided no obligatory guarantee beyond that furnished by the existing privileges of the Civil Code (Arts. 2,101 and 2,102). The Committee of the Chamber deputed to consider this Bill was unable, on its side, to make up its mind to give up entirely the principle of compulsory assurance, and moreover reverted to the plan of fixing a uniform figure for the compensation. The revised draft brought up on 7 July 1897 by M. Maruéjouls, the Reporter, re-affirmed in effect the obligation to assure, but limited it to mutual associations established voluntarily by those employers who did not desire to provide, individually or united in syndicates, certain deposits of which the amount was to be determined later on by an administrative regulation. As to the compensation, the Bill of M. Maruéjouls adopted very closely the rates previously proposed in 1893 by M. Ricard. It still seemed impossible on this basis to come to an agreement with the Senate. It was then that the Government and the Commission became happily inspired by a new idea, namely, the guarantee by the State of the solvency of the employers in consideration of an additional tax on licenses to be borne by the whole of the firms in a trade.

This guarantee of the ultimate solvency of improvident employers by a general tax, the proceeds of which would be certain, had the great advantage of rendering thenceforth unnecessary the obligation to assure, and, therefore, of allowing of the hope of an agreement with the Senate. In the month of January 1898, the Chamber passed the Bill so amended that, on being sent up to the Senate, it was not likely to encounter the former opposition of the Upper House. In its report, in fact, the Committee of the Senate, by the mouth of M. Shévenet, accepted the principle of the guarantee tax, and the only important change which it inserted was to expunge the right to demand the capital value of the annuities payable to the victims of accidents, or to their representatives, which had been included in the Bill of the Chamber. The debate in the Senate extended over two sittings, during which the Bill underwent certain other amendments, and was finally read the second time on 19 March 1898. On the following 26 March the Chamber passed without debate, and after urgency had been declared, the same text, which thereupon had the force of law.

The new law is applicable to the workmen and clerks in factories, in the building trade, mines and quarries, warehouses, the carrying trade, and in general in all trades wherein mechanical engines are used. It institutes for their benefit a different system from that of Art. 1,382 of the Civil Code.*

For workmen and clerks, up to 2,400 francs of the remuneration (for any excess, wages are counted only to the amount of one-fourth), it substitutes, for ultimate compensation determined at the discretion of the court, a definite compensation, varying according to the severity of the accident, and being of a penal nature. The rates of compensation, in case of death, of permanent disablement, total or

* This Article runs thus: "Every act whatsoever which causes injury to another imposes on him through whose fault that happens the necessity of making compensation."

partial, and of temporary disablement, are practically the same as in Germany and Austria; with this difference, however, that the annuity for partial disablement is calculated only on half the reduction of wages experienced, and not on the whole of that reduction.

Sickness assurance not being compulsory, as it is in Germany and Austria, it was necessary to provide compensation for all accidents of short duration, which in those countries are compensated for by Sickness Funds. With this object, temporary disablement from work entitles to compensation and to medical attendance from the fifth day.

The penal character of the compensation arising from trade risk, has as a result to suppress in principle all distinction between accidents according to degree of responsibility incurred, whether by the employer or by the victim. Also the law does not permit of any diminution of the compensation provided for, except in the event of an inexcusable fault committed by the victim. It abolishes compensation only in the case of an intentional fault. As to the liability of the employer, should it be proved that there was an inexcusable fault, it may be increased, and the annuities payable to the victims may, in such case, be augmented up to the total of the annual wages.

The law provides for the verification of the accidents; it simplifies the procedure, without establishing arbitration courts analogous to the German tribunals. No compulsory assurance is set up. As regards steps to be taken to meet their obligations, the law leaves to employers absolute liberty. For the life annuities payable to the injured suffering from permanent disablement from work, or to the representatives of workmen killed, it does not even insist on the employers who are liable paying up the capital value of these annuities. It is sufficient if they meet the payments as they fall due. The annuities must be paid by quarterly instalments.

In the absence of compulsory assurance, the payment of the compensation is nevertheless guaranteed by the State in the following manner:

A special Guarantee Fund is formed, the management of which is confided to a Government institution already in existence—the National Old Age Pension Fund. This Guarantee Fund is supported by annual additional centimes collected along with the license taxes borne by all the trades which come under the law. In case of the bankruptcy of debtor employers, the National Fund intervenes and pays the annuities to those interested, and withdraws the corresponding amounts from the Guarantee Fund. The annuitants, therefore, do not need to trouble themselves about the payment of the amounts due to them. If the employer who is liable does not pay, it is the National Fund which makes the payment, and which thenceforth takes their place in the recovery of the disbursements incurred on this account. It will proceed directly against the debtors. This case will only arise when the employer was not assured with a company or in a mutual association. In the other event the National Fund will have to intervene only if the company or the assurance society becomes bankrupt. It will then, in the same way, pay the annuities, and have recourse against the assurer. The fact of being assured, therefore, frees the employer from all liability. The tax from which the

Guarantee Fund is formed is not very high. Therefore the stability of the machinery which has just been described will depend, in the first instance, on the security offered by the assurance societies. Hence the necessity arises of placing these organizations under stringent supervision. The law provides for such supervision. It makes compulsory on the societies to set up reserves. The details of State control, as also the conditions under which the reserves are to be formed, will be settled later on by a public administrative regulation, at present in course of preparation.

Such are the principal provisions of the new French law. Between the socialistic State solution of compulsory assurance which has prevailed in Germany, in Austria, and in Norway, and a simple change in the rule of civil liability to which English and Danish legislators have confined themselves, it provides an intermediate solution, and happily reconciles the two current and opposite ideas of State socialism and free individualism.

The originality of this law consists principally of the guarantee of the compensation outside of all compulsion. Moreover, it only conceals the obligation to assure, because the recourse by the State in case of eventual insolvency will be a perpetual menace held over the heads of those who have not thought right to assure, and it will follow that everyone will assure. As has been said, without establishing compulsory assurance, this law creates obligatory assurance, which comes practically to the same thing.

What will be the results of the new order of things? Its first effect will be to develop, to an extent hitherto unknown, the private enterprise of accident assurance. The proprietary companies operating in France will have to recast their tables of rates and revise their policy conditions, so as to bring them into harmony with the provisions of the law. The compensation which at present they assure under their collective policies is only one-third, on the average, of that which henceforth will be the right of the victims. If they wish to continue to sell assurance at the same profit, they will have, consequently, to treble their premiums, which are already, as compared with the benefits assured in exchange, very high. It is doubtful if they can do this, because they will have to struggle against the constantly growing competition of the mutual syndical associations, which will multiply among the large and the medium trades. Accident assurance, in becoming general, and in becoming a necessity, will, therefore, become cheaper. It is, moreover, to be expected that the law will be completed by the reorganization of our National Accident Fund.

This institution, established 30 years ago, is in fact far from having prospered like its neighbour the National Pension Fund. The conditions under which it offered collective assurance were not convenient to the public, and it has never succeeded in attracting even the thousandth part of the connection which is distributed in France among the proprietary companies. Reform, therefore, is necessary in this direction, and it is to be hoped that the National Fund, adapted to the new conditions, will enter into serious competition with the private ventures, and will thus assume the part of moderator to prevent the enhancement of the price of assurance.

Statistical Estimates.—The number of workmen who will benefit by the law may be reckoned at four millions. If for basis we assume an average wage of 1,000 francs, and if we apply to the trades of France the average proportions of accidents experienced in Germany, we shall find that the annual expenditure for accidents, when matters attain to a permanent condition—that is to say in about 70 years—will amount to 125 millions of francs. This sum represents the compensation and the annual amount of current annuities. As a matter of fact, as the employers will all be assured, and will pay uniform annual premiums, this is not the figure which represents the effective charge upon industry. To estimate this charge, it must be assumed that the system of capitalization is to be applied, because the insurance societies requiring to retain in reserve the present values of the annuities, must receive each year from the commencement, an inclusive premium equal to the temporary compensation emerged during the year, and to the present value of the annuities falling into possession in the year. This inclusive premium will amount to about 76 millions, on the supposition of a rate of interest of 3 per-cent on investments, in assuming for the law of mortality among the injured, the table of mortality used in Austria for calculating the values of annuities for the injured, and for the law of mortality among widows, orphans, and progenitors, the table of the National Pension Fund.

The inclusive premium of 76 millions represents solely the expenditure incurred for compensation for accidents. To this must be added, the amount of the working expenses of the various insurance organizations, which, on the most favourable hypothesis, cannot be taken at less than 20 per-cent of the expenditure relating to accidents alone. The annual charge upon industry will therefore amount to nearly 100 millions. There is reason to believe that it will not fall below 90 millions.

At the time of the permanent condition, the annuities will be provided partly out of current premiums, and partly from the interest on the funds accumulated by the proprietary and mutual companies of all kinds. The capital sum necessary then, to make regular provision for the annuities will amount, on the above hypothesis, to about 1,700,000,000 francs. It will even exceed this figure if, as is to be feared, the rate of interest should still fall.

In the face of such large accumulations, it is worth while to ask how they are to be employed, and if the law permits industry to retain them in its own possession and to derive advantage from them. Even although the law does not provide for any State assurance, and thus does not in any way prejudge the question of the funds set apart for the annuities, yet it is beyond doubt that the regulations for the assurance societies will not allow them much latitude in this matter. It matters little whether the investment of the reserves is in the hands of the State, or whether it is entrusted to private institutions. The safety of the guarantee will not permit of these latter entering on speculative investments. The authorized investments will, therefore, be very similar to the present investments of life assurance companies, and it is probable that they will be made preferably in real property, which at present yields a higher return than can be secured on State funds or on other first-class securities. In any case, and notwithstanding the liberty allowed in that which concerns the method of

assuring, the new law will bring about the conversion into real property of capital to the amount of more than 1½ milliards, and which by the force of circumstances will be withdrawn from industry.

The tax intended to constitute the Guarantee Fund is small. The extra centimes will produce each year about 750,000 francs, that is, about 1 per-cent of the net inclusive premium. According to statistics, it may be fairly presumed that the annual bankruptcies will not amount to 1 per-cent of the corresponding expenditure. The tax for the guarantee, as it is fixed for the first years of the operation of the law, appears, therefore, to be ample. Under the provisions of the law it is, moreover, susceptible of alteration, and may be either diminished or increased as need arises.

Reparation des Accidents du Travail en Espagne.

Par J. MALUQUER Y SALVADOR.

Je pourrais mentionner beaucoup de lois pour démontrer qu'en Espagne, le principe de la responsabilité civile des accidents du travail est admis depuis des époques anciennes; mais je préfère indiquer une ordonnance qui prouve le désir des autorités à l'égard de l'application des dits préceptes. C'est un édit du Conseil Suprême de Castille, qui, pour éviter les fréquents accidents des maçons dans la Capitale, ordonnait, sous le regné de Charles III., qu'après quelques-uns de ces accidents, les juges devaient inspecter immédiatement la maison où la victime travaillait pour vérifier si les accidents avaient été produits par la négligeance du propriétaire. Dans ce cas les juges devaient imposer une punition au proprietaire et une réparation des dommages causés. L'édit mentionné disait, aussi, que ces faits illicites pouvaient être dénoncés par tout le monde. Enfin, il défendait au coupable de réclamer son droit, s'il l'avait, d'être soumis à une juridiction privilégiée quelconque.

Depuis la promulgation du Code civil de 1889, ont suit en Espagne les mêmes principes qui ont été appliqués chez importantes nations européenes, avant qu'elles ne publiassent de lois spéciales sur cette matière, comme le prouvent les concordances suivantes de quelques articles du dit Code avec ceux des Codes civils des nations telles que la France, la Belgique, l'Italie et la Suisse.

Indemnité de la part d'un individu des dommages causés par ses actions, par sa négligence ou par son imprudence—Art. 1,902 du Code espagnol; arts. 1,382 et 1,383 des Codes français et belge; arts. 1,151 et 1,152 du Code italien; et art. 50 du Code fédéral suisse des obligations.

Responsabilité pour les personnes dont on doit répondre—Art. 1,903 du Code espagnol; art. 1,384 des Codes français et belge; art. 1,153 du Code italien; et arts. 61 et 62 du Code suisse.

Responsabilité du propriétaire d'un edifice pour les dommages causés par sa ruine, lorsqu'elle est arrivée par suite de défaut d'entretien ou par le vice de sa construction—art. 1,907 du Code espagnol; Art. 1,386 des Codes français et belge; art. 1,151 du Code italien; et art. 67 du Code suisse.

Les susdits articles du Code civil ont donné lieu chez quelques nations, surtout en France, à un grand nombre de décisions judiciaires. Ils ont reçu aussi application en Espagne, et les sentences des Tribunaux à cet égard ont été confirmées par la Cour de Cassation, entre autres, dans les deux cas qui suivent :—Un jugement de la dite Cour du 27 juin 1894, déclarait que, dans les articles sus-énoncés du Code espagnol, se trouve l'obligation d'une compagnie de chemins de fer de réparer les dommages occasionés à un voyageur par un déraillement. Une autre sentence du 14 décembre de la même année, approuvait la concession d'une indemnité de 5,000 pesetas à la veuve d'un ouvrier, qui était employé dans une entreprise de spectacles publics, et qui mourut par suite de l'éboulement d'une muraille, dont la dite société, propriétaire de l'édifice, avait negligé l'entretien.

Il y a dans la ville de Madrid une "Sociedad para la Prevencion y Socorro de los Accidentes del Trabajo" (Société pour prévenir les accidents du travail et pour en secourir les victimes). Cette société procure des avocats et des avoués aux ouvriers lésés pour qu'ils puissent intenter gratuitement les demandes judiciaires, sous la condition que ces avocats et ces avoués percevront leurs honoraires dans le cas où les personnes responsables des accidents seraient condamnées à payer des indemnités.

La revue technique de Paris "L'Argus" publia l'an dernier un article sur le thème qu'en Espagne les assurances contre les accidents n'ont pas été aussi indispensables que dans d'autres pays, parce que les patrons secourent généralement les victimes des accidents du travail et parce que les sociétés de secours mutuels ont pris un grand développement.

La première de ces assertions est confirmée par l'enquête de la commission de réformes sociales déjà mentionée,[1] car les sentiments charitables guident dans ces cas-là beaucoup de fabricants. L'expression la plus parfaite de tels sentiments se voit dans les entreprises industrielles qui ont établi un système général de pensions de vieillesse en faveur des ouvriers ou un véritable asile d'invalides du travail.[2]

L'État, à son tour, créa par l'Ordonnance royale du 11 janvier 1887 et par la loi du 27 juillet suivant, un asile d'invalides du travail à Madrid, assimilant, pour la protection accordée aux invalides, les soldats de l'industrie avec ceux de l'armée, car les uns et les autres travaillent pour le bonheur de la patrie. Les préceptes de la dite loi reconnaissent le droit des invalides du travail, à quelconque province que les soient, pour occuper des places de l'asile, en préférant les victimes des accidents, et en exigeant d'autres conditions, parmi elles, celle d'être célibataires ou veufs, de n'avoir pas droit à une indemnité ou de ne l'avoir pas perçue etc. Le Conseil de patronage de l'asile est presidé par S. M. la Reine Régente.

A l'égard des bénéfices des sociétés de secours mutuels, le rapport correspondant démontre qu'en Espagne elles n'établissent pas de distinction entre les accidents et les maladies,[1] ce qui est un principe de la science populaire des assurances, particulier aussi à d'autres pays et

[1] Voir le rapport sur les "Sociétés de secours mutuels."

[2] Par exemple, dans les fabriques de la Viuda Tolrá et de Sert Hermanos, province de Barcelone. Le Gouvernement a récompensé la bonne action de Mad. la veuve Tolrá par le titre de Marquise.

L'Association des amis des pauvres, de Barcelone, se propose de construir un important Hôpital spécial pour les victimes des accidents du travail.

qui se trouve également dans les Friendly Societies. Beaucoup de sociétés de secours mutuels de ce pays-ci ont l'aide effective des patrons, par exemple, les associations déjà mentionnées de Bilbao et une société pour le secours d'invalides du travail, fondée en 1884 dans la ville de Sabadell, par 160 fabricants et 60 ouvriers, dont le dernier chiffre dépasse 1,000 maintenant.

M. Ugo Pisa, fondateur d'un Patronat ouvrier à Milan, demontre savamment la différence qu'il y a entre les droits restreints que les sociétés de secours mutuels accordent actuellement en cette matière, et les derniers progrès de l'assurance contre les accidents du travail. Cette distinction à été exposée par ce philantrope dans la sphère scientifique populaire et elle est bien connue sous son aspect technique par les membres du Congrès de Londres.

En Espagne jusqu'à present les efforts de quelques sociétés étrangeres d'assurances contre les accidents ont eu peu d'importance.

Divers projets de lois spéciales ont été présentés aux Chambres par le Gouvernement, tous basés sur un avant-projet de la Commission de reformes sociales.[1]

Le dernier de ces projets est celui du 5 juin 1894, sur les accidents professionnels.

Les accidents professionnels son produits, selon l'espèce de chaque industrie, par les causes suivantes: 1ère, par la force ou la vitesse des moteurs et des machines; 2ème, par la nature dangereuse des substances fabriquées ou de celles qui sont employées dans l'industrie; 3ème, par les conditions de la fabrique ou de l'atelier.

En cas de l'incapacité temporaire, l'ouvrier a droit: (*a*) au total du salaire, pendant le temps de la maladie et huit jours encore après le certificat médical de guérison; (*b*) aux frais medicaux et pharmaceutiques.

Dans le cas où l'accident cause la non-validité permanente ou absolue de l'ouvrier, le patron doit payer depuis 1,000 pesetas jusqu'à 5,000, et, en outre, lui rembourser les frais de sa maladie.

L'indemnité est de 200 à 500 pesetas, sans compter les honoraires du médecin et les dépenses pharmaceutiques, si l'ouvrier reste invalide pour certains travaux, mais non pour tous.

La mort par suite de l'accident, est indemnisée conformément aux règles qui suivent: 1ère, s'il y a veuve et enfants au-dessous de 18 ans, ou seulement des enfants mineurs, ils perçoivent conjointement depuis 1,200 pesetas jusqu'à 2,000, selon les circonstances de l'accident; 2ème s'il y a veuve, mais non enfants, elle a droit à 500 pesetas.

Dans tous les cas susdits, les frais de la maladie sont pour le compte du patron.

Toute discussion sur ces droits doit être soumis au verdict d'un jury spécial, composé du maire, qui est le président, d'un membre du Conseil municipal, d'un avocat, d'un ingénieur ou d'un architecte, d'un fabricant ou d'un propriétaire, et de deux ouvriers.

Enfin, ce projet dit que le délai pour la prescription du droit aux réclamations est de soixante jours, depuis la date de l'accident, de la guérison ou de la mort de la victime.

[1] Voir spécialement les paragraphes du dit rapport sur les Sociétés de Secours mutuels—"Risques assurés" et "Droits des associés."

ANNEXE.

Statisque des accidents personnels en Espagne.

Les données qui suivent ne sont pas une statistique complète sur cette matière, sinon un petit nombre de chiffres pour connaître à peu près les périls auxquels sont exposées les ouvriers espagnols, en y ajoutant quelques notices sur les accidents dans les voyages.

Accidents dans les Mines, pendant la période de 1880–84.

(Données de l'Institut officiel géographique et statistique.)

	Années	Nombre d'ouvriers	Morts	Blessures	
				Graves	Simples
Mines de charbon	1880	6,811	4	2	66
	1881	8,708	30	14	184
	1882	9,577	24	28	512
	1883	9,887	11	28	526
	1884	9,069	20	47	548
Mines métallurgiques et autres (fer, plomb, argent, or, cuivre, mercure, soufre, sel etc.)	1880	31,766	83	127	451
	1881	56,361	120	168	1,004
	1882	65,567	89	205	1,189
	1883	52,792	57	131	1,157
	1884	49,682	95	178	1,341

Accidents dans les Fabriques.

(Données apportées à une enquête faite par le Sénat.)

Ouvriers de Barcelone qui ont droit aux soins du médecin-chirurgien de la Federacion de las tres Clases de Vapor (ouvriers des industries de tissus, des filatures et préparateurs, par exemple, cardeurs et fouleurs).

Blessures et Contusions.

Années	Tissus	Filatures	Préparateurs	Hommes	Femmes	Total
1887	48	63	160	89	182	271
1888	82	110	186	136	242	378
1889	75	99	153	115	212	327
1890	64	87	127	97	181	278

Accidents sur les Chemins de Fer.

(Données de la Direction général des travaux publics.)

Années	Longueur des Lignes	Nombre de voyageurs	Accidents personnels			
			Morts		Blessés	
			Voyageurs	Total [1]	Voyageurs	Total [1]
1892	9,731	24,788,780	8	131	21	178
1893	10,847	33,732,962	22	157	119	352
1894	11,046	34,046,201	27	144	134	371
1895	11,318	34,278,027	14	133	114	366
1896	11,466	34,064,920	19	144	61	310

[1] Voyageurs, employés, etc.

Accidents sur Mer.

(Données de la Société espagnole de Sauvetage de Naufragés.)

9 Mars, 1881—13 Mai, 1886.

Sinistres	Sauvés	Noyés	Total
88	512	69	581

Translation.

Compensation for Accidents to Workmen in Spain.

By J. Maluquer y Salvador.

I could mention many laws to show that, in Spain, the principle of compensation for accidents to workmen has been admitted since ancient times, but I prefer to cite one regulation, which proves the intention of the authorities in regard to the application of these laws. It is an edict of the Supreme Council of Castille, which, in order to prevent the frequent accidents to masons in the Capital, prescribed, in the reign of Charles III, that after one of these accidents, the judges must immediately inspect the house where the man was working, to see if the accident was the result of the negligence of the proprietor. In such case it was the duty of the judges to inflict punishment on the proprietor, and to award compensation for the injury done. The edict also mentioned that these illegal acts might be informed of by any person. Finally, it forbade the culprit to claim his right, if he had one, of having his case submitted to any privileged jurisdiction whatever.

Since the promulgation of the Civil Code of 1889, Spain has followed the same principles as were applied by other important European nations, before they passed special legislation on this subject, as is shown by the agreement in the following particulars of some of the articles of the said Code with those of the laws of such nations as France, Belgium, Italy, and Switzerland:—

Compensation to be made by a person for injury caused by his actions, negligence, or carelessness.—Art. 1,902 of the Spanish Code; Arts. 1,382 and 1,383 of the French and Belgian Codes; Arts. 1,151 and 1,152 of the Italian Code; and Art. 50 of the Federal Swiss Code of Obligations.

Liability for the acts of persons for whom one is responsible.—Art. 1,903 of the Spanish Code; Art. 1,384 of the French and Belgian Codes; Art. 1,153 of the Italian Code; and Arts. 61 and 62 of the Swiss Code.

Responsibility of the proprietor of a building for injuries caused by its fall, if brought about by defect in maintenance or defect in construction.—Art. 1,907 of the Spanish Code; Art. 1,386 of French and Belgian Codes; Art 1,151 of Italian Code; and Art. 67 of Swiss Code.

The above-mentioned Articles of the Civil Code have given rise in some countries, especially in France, to a great number of legal decisions. They have also been applied in Spain, and the judgments of the courts in this respect have been confirmed by the Court of Cassation, amongst others, in the two following cases. A judgment of the above-mentioned Court, of 27 June 1894, declared that, by the above-stated Articles of the Spanish Code, a railway company is responsible for injuries to a passenger in the case of a train running off the line. Another judgment, of 14 December of the same year, approved the grant of compensation of 5,000 pesetas to the widow of a workman who was employed by a contractor for public entertainments, whose death was caused by the fall of a wall which the contractor owned, and which he had neglected to keep in repair.

There is in Madrid a "Sociedad para la Prevencion y Socorro de los Accidentes del Trabajo" (Society for Prevention of Accidents to Workmen and to help the Injured). This society provides counsel and solicitors for the injured workmen, so that they can enter a legal action for damages without incurring costs, on the condition that the counsel and solicitors shall receive their fees if the persons responsible for the accident are condemned to pay compensation.

The actuarial paper of Paris, *L'Argus*, published last year an article to show that in Spain assurance against accidents has not been so necessary as in other countries, because usually employers compensate workmen injured by accidents, and because friendly societies have been largely developed.

The first of these statements is confirmed by the investigations of the commission on social reforms already mentioned,* because in these cases charitable motives influence many manufacturers. The most perfect expression of these motives is seen in the industrial undertakings which have established general schemes of old age pensions for workmen, or a real refuge for those worn out by labour.†

The State, in its turn, founded by Royal Decree of 11 January 1887, and by law of 27 July following, an asylum at Madrid for injured workmen, thus, so far as the injured are concerned, putting the soldiers of trade on a line with those of the army, because they equally work for the good of a common country. The provisions of this law recognize the right of invalided workmen, whatever province they come from, to be received into the asylum, giving preference to those injured by accidents; and lay down certain conditions; amongst others, that of being bachelors or widowers, and that they have no right to any compensation, and have received none, &c. The President of the Council of Patronage of the Asylum is H.M. the Queen Regent.

In regard to the benefits of the friendly societies, the paper on this subject* shows that in Spain there is no distinction drawn between accidents and illness, which is a principle of the science of insurance as understood by the people, admitted also in other countries and equally recognized by friendly societies in England. Many of the

* *See* the Paper on "Friendly Societies."

† For example, in the factories of Viuda Tolrá and of Sert Hamanos, in the province of Barcelona. The Government recognized the philanthropic work of the Widow Tolrá, by giving her the title of Marchioness. The Society of the Friends of the Poor in Barcelona proposes to build a special hospital for injured workmen.

friendly societies of this country have the practical support of the employers. For instance, the societies of Bilbao above mentioned, and a society for the help of invalided workmen founded in 1884 in the town of Sabadell by 160 manufacturers and 60 workmen, the latter now numbering more than 1,000.

M. Ugo Pisa, founder of an Employers' Society for Workmen in Milan, demonstrates learnedly the difference which exists between the restricted benefits that the friendly societies actually accord in this matter, and the latest progress of insurance against workmen's accidents. This distinction has been explained by that philanthropist in a popularly scientific way, and is well known in its actuarial aspects by the members of the London Congress.

Up to the present, in Spain, the operations of a few foreign accident insurance companies have been of small amount.

Several schemes of special legislation have been presented to the Houses of Parliament by the Government, all based on a preliminary draft by the Commission on Social Reforms. *

The last of these schemes is that of 5 June 1884, on Trade Accidents.

Trade accidents are the result, according to the nature of the employment, of the following causes: firstly, the power or speed of engines and of machinery; secondly, the dangerous nature of the materials manufactured, or of those employed in the trade; thirdly, by the state of the factory or workshop.

In case of temporary disablement, the workman has the right *(a)* to the whole of his wages, during the time he is ill and for eight days after the doctor has given a medical certificate of recovery; *(b)* to fees to his doctor and cost of medicine.

In the case where the accident causes permanent or total disablement, the employer has to pay from 1,000 to 5,000 pesetas, and also to defray the expenses of the illness.

The compensation is from 200 to 500 pesetas, without counting the doctor's fees and the cost of medicines, if the workman is unable to do certain work, but is not altogether incapacitated.

Death resulting from an accident is compensated according to the following rules: firstly, if there is a widow and children under 18 years of age, or only children who are minors, they receive jointly from 1,200 pesetas up to 2,000, according to the circumstances of the accident; secondly, if there is a widow, but no children, she has the right to 500 pesetas.

In all the cases mentioned above, all the expenses of the illness have to be defrayed by the employer.

All disputes as to these rights must be submitted to the verdict of a special jury, composed of the Mayor, who is the President, one member of the Municipal Council, one lawyer, one engineer or one architect, one manufacturer or proprietor, and two workmen.

Finally, this scheme provides that the claim must be made within sixty days from the date of the accident, or of the recovery or death of the victim.

* *See* more particularly the paragraphs of the Paper on Friendly Societies—"Contingencies Assured Against" and "Benefits of Members."

APPENDIX.

STATISTICS OF PERSONAL ACCIDENTS IN SPAIN.

N.B.—The following particulars are not complete, but merely give a few figures to show approximately the risks to which Spanish workmen are exposed: also, some facts as to accidents in travelling.

Accidents in Mines, from 1880 to 1884.

(Particulars obtained from the Official Geographical and Statistical Institute.)

	Year	Number of Workmen	Killed	Injured	
				Severely	Slightly
Coal Mines	1880	6,811	4	2	66
	1881	8,708	30	14	184
	1882	9,577	24	28	512
	1883	9,887	11	28	526
	1884	9,069	20	47	548
Metal and other Mines (Iron, Lead, Silver, Gold, Copper, Mercury, Sulphur, Salt, &c.)	1880	31,766	83	127	451
	1881	56,361	120	168	1,004
	1882	65,567	89	205	1,189
	1883	52,792	57	131	1,157
	1884	49,682	95	178	1,341

Accidents in Factories.

(Particulars furnished at an Enquiry by the Senate.)

Workmen of Barcelona, who are entitled to be attended by the Doctor of "La Federacion de las tres Clases de Vapor."

(Workmen in the Cloth Industry, Weaving, Spinning, Preparing Raw Material, such as Wool-Combing and Dyeing.)

Wounds and Injuries.

Year	Weavers	Spinners	Preparers of Raw Material	Men	Women	Total
1887	48	63	160	89	182	271
1888	82	110	186	136	242	378
1889	75	99	153	115	212	327
1890	64	87	127	97	181	278

Railway Accidents.

(Particulars supplied by the Board of Public Works).

Year	Length of Railways	Number of Passengers	Personal Accidents			
			Killed		Injured	
			Passengers	Total *	Passengers	Total *
1892	9,731	24,788,780	8	131	21	178
1893	10,847	33,732,962	22	157	119	352
1894	11,046	34,046,201	27	144	134	371
1895	11,318	34,278,027	14	133	114	366
1896	11,466	34,064,920	19	144	61	310

* Passengers, Employees, &c.

Accidents on the Sea.

(Particulars supplied by the Spanish Society for Rescue from Shipwreck).

9 *March* 1881 *to* 13 *May* 1886.

Wrecks	Rescued	Drowned	Total
88	512	69	581

On Compensation for Accidents to Workmen in the United Kingdom. *By* S. Stanley Brown, *General Manager of the Employers' Liability Assurance Corporation, Limited.*

As I have been honoured by the invitation to speak to-day on the position of this matter in England, and as I am aware that others have been invited to speak in the same way for France, Germany, and other countries, I presume it is intended by the organizers of the Congress to give the opportunity hereafter of comparing the principles and methods adopted by the different countries in connection with this matter, and therefore I abstain from any attempt at comparison now, and confine myself to the subject simply as it is entrusted to me.

In England, the theory of compensation for injury by accident has been founded on the liability at Common Law of any person guilty of negligence to compensate the injured person for the damages that flow directly from such negligence. But since the early years of the present century, a wide difference has been made by the decisions of our Courts in their application of this principle to two different classes of injured persons, who may be defined: (1) Strangers having no contract of service with the person charged with negligence; (2) Workmen having a contract of service with the person charged.

In the case of the first class, every citizen is bound to use, in his conduct of possession and enterprise, reasonable care towards all others, and a breach of this duty to such others, in the absence of an express stipulation to the contrary, is negligence. "Reasonable care" as regards a stranger imposes responsibility on everyone for the negligence of himself, of his superintendents, and of all others his workmen, subordinates, and agents.

In the case, however, of the second class (workmen), the contract of service is brought in to restrict the meaning of "reasonable care":

> "When the workman contracts to do work of any particular "sort, he knows, or ought to know, to what risks he is exposing "himself; he knows, if such be the nature of the risk, that want "of care on the part of a fellow workman may be injurious or "fatal to him, and that against such want of care his employers "cannot protect him. If such want of care should occur, and "evil is the result, he cannot say (as a stranger might) that he "does not know whether the master or the servant was to blame. "He knows that the blame was wholly that of the servant. He "cannot say that the master need not have engaged in the work, "for he was a party to its being undertaken."

Lord Justice Bramwell states the restriction very clearly: that in consequence of the contract of service between employer and workman,

the workman cannot recover unless he has "stipulated for a right of "action against his master if he sustains damage from the negligence "of a fellow servant."

These conclusions import what is known as the doctrine of "common employment", which has the effect of destroying the claim of the injured man, if a workman, when the negligence is that of a superintendent or of any other person in the employment of the master.

The principles so laid down were pressed more and more severely against the workman, until the restriction, which was conceivably equitable in the case of the smaller industries of former years, was made to apply in the case of more recent and indefinitely extended undertakings, so that it embraced the slight relationship existing between a miner and the engineers of the mine, a railway milesman and a railway traffic manager, a seaman and the captain of his ship.

As industrial enterprise progressed, bringing larger numbers of workers under the same control, this restriction operated with greater power, until the workman was excluded from recovering compensation, except in the infinitesimal percentage of cases of the employer's own personal negligence, and, therefore, practically from recovering at all.

The sense of injury set up led to many and continual efforts on the part of the workmen to better their condition in this respect, and in the result the Employers' Liability Act was passed into law in the year 1880. The effect of this Act was to loosen the restriction to an extent important as to the number of cases opened up for recovery by the workman; but still more important by reason of the blow struck at the doctrine of "common employment." In my review of that restrictive principle I stated that it destroyed the claim of the injured workman when the negligence is that of a superintendent or of any fellow workman. The Employers' Liability Act restored the claim of the injured workman, so far as the negligence of a superintendent is concerned, with limitations, however, to the amount of damages, but left him still restricted from his claim, founded on the negligence of any other fellow workman.

Various efforts in the same direction followed. In 1893 an attempt was made by the Government of the day to proceed to the total destruction of the doctrine of common employment, by restoring the workman's claim in the case of negligence of all and every of his fellow workmen, and thereby leaving the workman, in his right for damages for injuries resulting from negligence, in exactly the same position as a stranger. The two Houses of Parliament appear to have agreed as to the main principle of the Bill, but to have disagreed as to restricting another Common Law right, namely—the right of a workman, for a consideration, to contract out of the benefits of the Bill, and, as a consequence the Bill did not become law.

Reviewing the conditions up to the date of our latest legislation, we may conclude that the restriction on the power of recovery which was applied with equity when the employer was brought into personal contact with all his workmen, had been applied more and more rigorously by the strict logic of the law. At the same time, the altering conditions of industry tended to remove the person of the employer from contact with his men, until he became the distant brain that controlled the unseen labour, or faded into the impersonality of a company limited by shares, and the anomaly at last gave offence to

the public conscience. The result was a desire on all sides, in respect of recovery of damages, to bring back the workman to a position as favourable as that of any other member of the community, and to destroy the difference in this regard between the workman and the stranger to the work.

The public mind was, without doubt, prepared for legislation of this kind; but more extended theories were in discussion, and in some countries had been reduced to practice and experience. It began to be urged that legislation of this kind would leave at least half of the accidents happening unprovided for, namely, those due to simple misadventure or to the negligence of the sufferer himself; that the workman, in respect of these, should be put in a better position than the stranger to the work; and gradually was evolved the theory that each industry should bear the cost of its own accident and misadventure, and that the workman should be able to recover for all accidents of every kind. It was soon evident that legislation of this kind no longer dealt alone with the proper legal liability of employers, and it is not surprising, therefore, that the latest act which embodies these ideas should appear not as an amendment of previous Employers' Liability Acts, but should mark clearly the new departure under the name of "The Workmen's Compensation Act (1897)."

This Act, as to the people affected by it, not only enables the workman to recover for negligence under the same rules as the stranger to the work, but ensures to the workman rights of compensation in the contingencies of pure misadventure and of his own negligence which are denied to any other; and such is the swing of the pendulum, that the same contract of service which formerly restricted his rights to compensation, has now extended them, restoring to him not only his claim for accidents attributable to negligence not his own—say, fifty out of a hundred—but also giving him a claim to the whole hundred. The principles of its construction are so daring, the extent of its application so wide, and the interests affected by it so important, that it well repays to study in detail "The Workmen's Compensation Act, 1897."

I ask you to note, in the first instance, that "The Workmen's Compensation Act, 1897", does not apply to all occupations. The definitions leave doubt as to the application of the Act to some occupations, but they are not of important amount or number, and the doubt will be quickly resolved by experience.

The main occupations to which the Act does not apply are—

Domestic servants.
Seamen.
Farm labourers.
Workshop employees.

The occupations to which it does apply are defined in Section 7, Sub-section 1 and Sub-section 2, as employment on, or in, or about—

Railways.—Heavy and light.
Tramways.—Steam, electric, or horse.
Factories.—Textile, using steam, water, or other mechanical power, *e.g.*, cotton, wool, hair, silk, flax, hemp, &c. Non-textile, power or no power, *e.g.*, print works, bleaching, dyeing, earthenware; blast furnaces; copper mills; iron mills;

iron, steel, tinplate manufactories; foundries; machinery and metal article manufactories; india-rubber, gutta-percha, tobacco, factories.

Also when using steam, water, or other mechanical power, shipbuilding yards, quarry banks, pit banks; any premises using such power and engaged in making, altering, and adapting for sale any article.

Docks, Wharves, Quays, and Warehouses.—Including loading and unloading.

Laundries.—Steam.

Mines.—Coal, iron, stone, shale, fire-clay, minerals.

Quarries.—Places, not being mines, in which slate, stone, and other minerals are obtained, any part of which is more than 20 feet deep.

Engineering Work, *i.e.*, construction, alteration or repair of railroads, harbours, docks, canals, sewer, or any other work for which machinery driven by mechanical power is used.

Building Work 30 feet high, or on which machinery driven by mechanical power is used.

Having determined the employers who come under the provisions of the Act, let us consider under what circumstances they will become liable. Each employer will be liable in case of—

(*a*) His own personal negligence.
(*b*) The negligence of his superintendents.
(*c*) The negligence of all his other workpeople.
(*d*) The negligence of all the workpeople of all his sub-contractors.
(*e*) The negligence of any person whatsoever, if it results in injury to the workman of the employer arising out of, and in the course of, the employment.
(*f*) Misadventure of any kind in the course of the employment.

The first of these (*a*) coincides with the circumstances bringing in liability at Common Law; the second (*b*) with the circumstances imposing liability under "The Employers' Liability Act, 1880"; the third and fourth (*c*, *d*) destroy the remaining part of the restriction of Common Law, and bring in sub-contractors' men as agents of the employers; the fifth (*e*) and sixth (*f*) bring in all the very numerous cases of negligence of casual persons, and of any other misadventure in the course of the employment.

We know now, with fair accuracy, what employers are made liable, and for whom they are liable; the next consideration is to whom they are liable. They are liable to the "workmen." The definition prior to the passing of the Act, limited a workman to a person engaged in manual labour. By the definition of this Act, "workman" includes every person engaged in manual labour "or otherwise", extending the liability thereby to all classes of foremen, draughtsmen, clerks, inspectors, and managers.

Moreover, clause 4 of the Act extends this liability for workmen, defined as above, beyond the employer's own workmen, so as to include the workmen of all his sub-contractors.

Remembering the occupations concerned, let us glance a moment at the probable number of workpeople. The annual report of the

Chief Inspector of Factories and Workshops for 1896 states the persons employed in all textile and non-textile factories at about 3,556,000; the report of the Inspector of Mines, 1896, states the persons employed in coal and metalliferous mines and quarries at 838,632. If to these are added reasonable estimates for railways and engineering and building works, and allowing for exceptions, the total number of workpeople concerned cannot be less than 5,000,000, and the insurable interest represented by their wages not less than £350,000,000 per annum.

The next inquiry to which I invite you is, what is the measure of the compensation to be paid to the workmen injured by accident arising out of his employment. These compensations are determined by the first schedule to the Act. Most of the clauses deal with conditions and regulations of money, medical examination and the like, but the gist of the whole matter will be found in the First Schedule, clauses 1, 2 and 13. The compensation is prescribed for those cases where death results from the injury; where total or partial incapacity results from the injury.

Let us consider them in the same order, namely, the cases of—

> Death, wherein the deceased leaves persons wholly dependent; in such, the compensation is 3 years' wages; not less than £150 nor more than £300.

In this connection, it should be remembered that the minimum raises all less wages to 20*s.* a week, and that the maximum reduces all higher wages to 40*s.* a week.

> Death, wherein the deceased leaves persons partially dependent. In such, the compensation is what may be agreed on or determined by arbitration as reasonable and proportionate to the loss sustained, but not more than 3 years' wages, or £300.

I ask you to note here that although the maximum is retained, the minimum is omitted, and the idea of proportion imported.

> Death, wherein the deceased leaves no one dependent on him. In such, the compensation is "reasonable expenses" up to £10.

The cases of incapacity are divided into those of total and partial incapacity, and no direct mention is made of permanence, nor is there any limit of duration. In either of these cases, the compensation is a weekly payment after the second week not exceeding 50 per-cent of his average weekly earnings, and not exceeding £1. You will notice at once here the exclusion of the first two weeks of incapacity, to which I shall refer again later, and I ask you in addition to note that both for total and partial incapacity, the limit is half wages, not exceeding £1. I think we should infer from this statement that the compensation for partial being equitably less than the compensation for total incapacity, it follows the compensation for partial should always be something less per week than the compensation for total incapacity; but I am bound to tell you that many of those who have been looking into this Act infer that the compensation for the partial may be fixed, however illogically, as high as that for total incapacity.

I submit, moreover, there is confirmation for the first inference in the First Schedule, clause 2, which says the measure of the weekly compensation shall be the difference between the wages before and the wages after the accident. The maximum compensation for the maximum

injury is half-wages; it follows, I think, that the compensation for a less injury must be proportionately less than half-wages. The obscurity of these clauses affects the conclusions as to cost discussed later.

The absence of any limit to duration of the payment for incapacity brings in the idea of long-continued payments for permanent incapacity, measured by the expectation of the sufferer's life, and any section of the Act referring to this should be closely scanned. In 1st schedule, clause 13, there is a power given, but to the employer only, to commute after six months. This provides that the liability for the weekly payment may be redeemed by the payment of a lump sum, to be settled by agreement with the injured man; or, in default of such agreement, by the arbitrator. Whatever value there may be in this provision, it appears to me, would vanish in proceedings by arbitration. The arbitrator, sitting as judge, must have determined for him by skilled medical evidence the duration in time of the incapacity, and must award the present value of the weekly payment during the time so determined: a conclusion that could not certainly be to the advantage of the employer. We must look, therefore, to the value of this in the permission to fix the lump sum by agreement. Herein it is quite possible that a reasonable sum down would be of more value to the sufferer than the continuance of a small weekly dole, and would be a remission in part of the cost to the employer. This power of commutation will be again referred to in discussing the cost of the Act.

The time limit for claim to recover compensation under this Act is six months from date of accident, if not fatal, or from date of death if fatal, and the claimant cannot maintain proceedings unless he has given notice of accident "as soon as practicable", but the obligation as to the notice of accident is of so slight a character that in most cases the notice of accident and claim may be served together by the claimant any time, at his own option, up to and within the six months mentioned.

When the claim is so started, but not until, the claimant must submit himself for examination by a doctor on behalf of the employer, and upon the result of such an examination, renewed from time to time, the claimant and the employer may agree the amount of weekly compensation to be paid under the provisions of the Act.

But if the parties fail to come to an agreement, then this and all other matters in dispute must be settled by arbitration in the methods prescribed in the 2nd schedule, which are, shortly, these:

1. There may be a committee in the works chosen for the purpose by the employers and their workmen. Such a committee can sit as arbitrator and settle the matter.
2. If the committee decline to determine the matter, they may refer the matter to any person agreed upon by them, who thereby becomes the arbitrator.
3. If, however, the committee fails to determine and to refer the matter, the parties can themselves appoint the arbitrator.
4. If all the foregoing methods fail, then an arbitrator will be appointed by the County Court Judge, and he may, in some cases, appoint himself.

Except in the case of the last method, which it is supposed the usual County Court rules will govern, no provision is made as to

procedure. The arbitrators will take their evidence, conduct their proceedings, and register their decisions in what way they please.

This, however, is not the most serious aspect of the method of arbitration, for, no doubt, rough justice will be done in the majority of the cases; a vastly more important consideration, especially in the cases of deaths and long disablement, is that the decision arrived at by the methods I have suggested is irrevocable. The arbitrators, whether a committee or single arbitrator, or County Court Judge, will have to decide all questions of fact. The main questions will be: Identity, wilful misconduct, the extent of the injury, the duration of the disablement, the compensation to be awarded; and upon all these and kindred matters the decision of the arbitrator is final. He cannot himself allow an appeal, nor can appeal be made in any way.

The arbitrator has a similarly decisive power in questions of law; but here the procedure is not so absolutely binding. There may be an appeal—not, however, at the wish of the parties; not in obedience to the order of a higher Court; but only if the arbitrator thinks fit.

In the procedure under the Act, next in importance to the arbitrator, stands the duly-qualified medical practitioner. He must certify the death; he must certify the injury; he must determine, from time to time the extent and duration of the disablement; and he must give evidence on all these points before the arbitrator. If his evidence on any of these points is disputed by the claimant, the arbitrators can then call in as medical assessor practitioners appointed by the Secretary of State for the purposes of this Act. Upon his evidence and credibility will depend, in a great measure, the extent and duration of the compensation awarded, and, necessarily, the consequent cost.

Having laid before you the general scope of the Act, it is right I should now speak of the two limitations contained in the Act itself, which tend to reduce the liability of the employer. The first of these is contained in Clause 1, sec. 2, s.-s. (*c*), and is to the effect that where the employer can prove the wilful and serious misconduct of the injured man, he may escape liability. A good instance of wilful and serious misconduct will be infraction by the injured person of the regulations controlling his labour, as under the Coal Mines Regulation Act. By process before a magistrate, such a person could be punished, and, if found guilty, would probably be held, in regard to the Compensation Act, to be guilty of wilful and serious misconduct. But, if it is remembered that simple negligence will not be sufficient, that the tribunal before which the case will be tried is not of a high class, and that the proof will be very difficult, I am of opinion that we may dismiss this as a serious limitation to the employer's liability.

The second limitation, however, is more important, and it is to the effect that the employer shall not be liable for an injury until after the workman has been disabled for two weeks. To show the effect of this, I have set out in Table A the experience gained from nearly 80,000 accident cases dealt with under arrangements which secured to the sufferer a fixed benefit without reference to negligence or any other liability. An examination of this Table shows that no less than 58·8 of the whole number happening are disposed of by a duration of disability of two weeks or under, and that 40·37 per-cent entail a

disablement lasting more than two weeks. The average duration of these over two weeks was 6·8 weeks; and in our further discussion of this matter the figures assumed will be 60 per-cent two weeks and under; 40 per-cent over two weeks, with a duration of six weeks, less the two weeks excluded by the Act, a net duration of four weeks.

I have now arrived at a point at which we may begin the consideration of the cost of the Workmen's Compensation Act. To determine this, we must consider the various classes of accidents in relation to their amount, their duration, and their number. Speaking first of their amount, I have set this out in Table B. The first difficulty in connection with this arises in connection with permanent partial disablement, which, in the table, is expressed as an amount, generally less, but up to half-a-week's wages. Here I must ask your attention to the first Schedule, Clause 1*b* and 2. A considerable divergence of opinion exists as to whether it is possible that partial disablements may receive a compensation as great as that allotted to a total disablement. It is, of course, illogical that this should be possible, and a clear inference from the clause to which I refer would seem to bind the arbitrator to fix the compensation, in proportion to the difference between the wages of the injured man before and after the accident, but in some way less than the maximum awarded to total disablement. There is a further divergence as to whether or not the compensation shall make good the whole loss, or one-half the loss only, as might be inferred from the limitation of the compensation for total disablement to one-half the week's wages. I have set these different views before you in Table C, and have set out also in the same table the percentage of cases affected by the different degrees of incapacity. On the severe assumption that the whole loss is to be made up, the resulting average compensation would be 31·6, or, say, one-third of the wages, the figure which I adopt in future calculations. I think that the rest of this Table requires no further comment, but fully discloses the amount of the compensation.

In the next Tables, D, E, and F, I make an attempt to present the conclusions as to duration. There is no difficulty with the temporary total disablement which may be expected to be discharged by a small number of weeks' payment, nor in the case of death, because the compensation is determined in the Act itself at a capital sum.

The cases of permanent total disablement, however, present greater difficulties. Undoubtedly the lives of persons so severely injured as to be classed under this head would be seriously impaired, but, as far as I am aware, there are no tables in existence showing the expectation of life of persons totally disabled. The method which I have adopted in my estimates is shown in Table E, and the assumption I have made therein to give effect to the lessened expectation of life, is based on a careful consideration of such figures as were at my disposal.

But the chief difficulty arises in dealing with cases of permanent partial disablement. There is no doubt that each injured person receiving compensation may insist upon its payment during the continuance of the disability, and therefore that there is no limit except the expectation of his life. In this connection, however, I have to bring to your notice, that by 1st Schedule, Clause 13, a power is

given, not to the injured man, but to the employer, to redeem the weekly payment by the payment of a lump sum, and I must ask your consideration to the effect of this power of commutation. I ask you to agree with me in thinking that the willingness of the injured person to accept a lump sum will be in proportion to the slight character of his disability; that is to say, that a man almost totally injured would be less inclined to commute than a man whose incapacity is measured by one-fifth of his wages. Proceeding on this assumption, I have compiled a Table F, which expresses the power of the commutation.

The effect is that on an average each case of permanent partial disablement may be expected to be discharged by 1·37 years' wages, and that the expectation of life may be omitted altogether.

Having now determined the classes of accidents in relation to their amount and duration, I am able to deduce the cost per case of the several classes of accident, expressed in terms of one year's wages. This will be found set out fully in Table I, and as there is nothing more involved in it than bringing together previous tables, I need not further comment upon them, excepting to remark that I shall use the present cost in one year's wages in my future calculations. The remaining question is the number of accidents happening, and the number expected from each class of accident. To arrive at a conclusion on the point of numbers, I have examined eight years' results of the German experience, seven years' results of the Austrian experience, the 80,000 of the English experience, and such other experience as can be derived from the records of the chief mutual benefit societies. The number involved in all these, of course, amounts to more than could be conveniently stated in such a paper as the present, but the conclusions arising from all this matter have been reduced for convenience, to their application to 100,000 men employed during one year, and the calculation contained in the Table G, is as follows: Upon 100,000 men there are expected to occur, on the average, 9,000 accidents of all classes. Excluding from these, 60 per-cent of the whole number, for those which entail the disability of two weeks or under, or 5,400 in number, the number left to be paid for is 40 per-cent, or 3,600. Of these, we know that the death cases require 70 divided into 30 and 40 for those cases where persons are left who were wholly or partially dependent upon the deceased. The number of those falling under the permanent total class is ·75 per-cent of the total number to be paid for, that is, ·75 per-cent of 3,600=27. The number of those in the permanent partial class is, $8\frac{3}{4}$ per-cent of the number to be paid for, that is, $8\frac{3}{4}$ per-cent of 3,600, equal in number to 312. Deducting all these from the number to be paid for, there remain in the temporary total class, over two weeks, 3,191.

The method adopted for arriving at the percentage of fatal cases in which dependants are left and in which no dependants are left is shown in Table H.

I am now able to carry you on to the cost (Table J) of all the cases in the several classes of accident expressed in terms of one year's wages on the occupation of 100,000 men, and thereby to arrive at a definite cost for the compensation only expressed in the percentage of wages.

Stating these conclusions in the order of the accident, and using

the cost of each case and the number in each class as multipliers, I am enabled to determine the cost per-cent of wages for the different classes and the total, showing, in the result, a pure loss ratio of 16*s.* 8*d.* per-cent of wages paid. To this, of course, must be added the various expenses, including medical service, the observation of accident cases, to prevent malingering; the cost of arbitration and litigation control, management, and profit. The gross addition of all these items is 66 per-cent, raising the rate from 16*s.* 8*d.* to nearly 27*s.* 10*d.* per-cent on the wages.

It should be remembered that this is not a rate applying to any particular trade or trades, but is taken as a general average rate, in comparison with which, according to their different circumstances, the several trades of the country which are included in the operation of the Act are rated. In other words, this is a standard rate, and as each trade varies from this in number of accidents, possible duration, or amount of wages, so is its rate computed. The rates determined upon this basis vary from 10*s.* per-cent of wages to £5 per-cent of wages, as may be seen by reference to Table K, in which I have set out some specimen rates.

If I now apply this average rate of 27*s.* 10*d.* per-cent to the trades coming within the operation of the Act, in which, as I have before stated, the number of persons employed may be taken at five millions, and the annual wages at £350,000,000, it follows that there is an insurable interest in connection with this liability represented by premium of nearly £5,000,000 per annum. The magnitude of this interest, however, in connection with the more important industries, such as railways, and the associations of others, such as coal mines, shipbuilders, engineers, leads to the conclusion that a great part of this risk will be undertaken and covered by the industries themselves, and that only a small proportion will fall to the share of the insurance companies.

No such consideration, however, limits the importance of this Act in its social and political aspect. Using the numbers of accidents which are assumed to happen under this new law, and comparing its effects with the law of the beginning of this century, there is no doubt that whereas one accident was compensated under the old system, 40 accidents will be compensated under the new.

TABLE A.

"Workmen's Compensation Act, 1897."

	No.	Percentage
Total Number of *Cases* of Accident investigated .	79,000	100
Of which there were of two weeks' duration and under	46,467	58·8
and of over „ „	31,898	40·4
and deaths	635	·8
	79,000	100

Total Number of *Weeks* for which compensation was paid in respect of the 31,898 Cases of over two weeks' duration 216,543

i.e., an average per Case of . . 6·8

Note.—The cases investigated included cases of permanent as well as of temporary disablement. The insurances which furnished the basis of the statistics, did not make it necessary to distinguish between permanent and temporary. It is estimated that, if the cases of permanent disablement were eliminated from the statistics, the average duration of the remaining temporary disablement cases would be reduced to six weeks, or four weeks, omitting the first two weeks not compensated.

TABLE B.

"Workmen's Compensation Act, 1897."

Amount and Limits of Compensation.

Nature of Injury resulting from Accident	Compensation	
	Amount	Limits
Disablement:		
Temporary Total.		
Two weeks . . .	*Nil*	—
Over two weeks . .	Half-week's wages	One Pound
Permanent Partial . . .	Generally less than, but up to half-week's wages	One Pound
Permanent Total . . .	Half-week's wages	One Pound
Death:		
When deceased leaves no dependants	Necessary expenses	£10
When deceased leaves relatives partially dependent . .	Up to three years' wages	£300
When deceased leaves relatives wholly dependent .	Three years' wages	Not less than £150 Not more than £300

TABLE C.

"Workmen's Compensation Act, 1897."

Permanent Partial Disablement—*Effect of First Schedule, Clauses 1b and 2.*

Amount of Compensation.

Percentage of Cases	Extent of Incapacity, expressed in percentage of Week's Wages	Application of Clauses 1b and 2. Compensation in percentage of Week's Wages on assumption	
		(1) that the whole Loss of Wages is made up (not exceeding limits of Act)	(2) that one-half the Loss is made up
68	25	25	12½
16	42	42	21
9	60	50	30
7	75	50	37½
100	...	...	...
Resulting Average Compensation for each Case		31·6 } say 33 % of Wages	17·1 say 17 % of Wages

TABLE D.

"Workmen's Compensation Act, 1897."

Duration of Compensation.

Nature of Injury resulting from Accident	Duration
Disablement:	
Temporary Total.	
Two weeks	Not compensated.
Over two weeks . . . (*See* Table A—note.)	Average four weeks (that is, six weeks less two, the first two weeks not being paid for).
Permanent Partial	During disability, *i.e.*, expectation of life, with possibility of commutation.
Permanent Total	During disability, *i.e.*, expectation of life, with possibility of commutation.
Death:	
When deceased leaves no dependants	Compensated by capital sum (no duration).
When deceased leaves relatives partially dependent.	
When deceased leaves relatives wholly dependent . . .	

TABLE E.

"Workmen's Compensation Act, 1897."

Permanent Total Disablement—*Estimated Cost per Case expressed in terms of a Year's Wages.*

The average duration for the payment of the weekly benefits, if life were unimpaired by the injuries, taken at . . .		21½ years
Deduct—		
For impairment of life . . .	5 years	
For effect of commutation by a lump payment	2 „	
		7 „
		14½ years
The present value of an allowance of half-wages for 14½ years (2¾ per-cent interest) is		6 years' wages

TABLE F.

"Workmen's Compensation Act, 1897."

Permanent Partial Disablement—*Estimated Effect of Commutation permitted by First Schedule, Clause* 13.

Assumed Compensation, in percentage of Week's Wages	Assumed Compensation, expressed in Years of Benefit	Percentage of Cases (*see* Table C)	No. of Cases (*see* Table G)	Total Years of Wages
25	1·5	68	212	79·5
42	5	16	50	105
50	8	9	28	112
50	12	7	22	132
...	...	...	312	428·5

i.e., 312 Cases cost 428·5 years' Wages = 1·37 years' Wages each.

TABLE G.

"Workmen's Compensation Act, 1897."

Numbers of Accidents in Different Classes.

Nature of Injury resulting from Accident	Percentage	Stated for the employment of 100,000 men for one year.
Disablement:		
Temporary Total.		
Two weeks	60·0	5,400
Over two weeks . . .	35·5	3,191
Permanent Partial	3·5	312
Permanent Total	·3	27
Death:		
When deceased leaves no dependants (about 44 per-cent) . . .	·3	30
When deceased leaves relatives wholly or partially dependent (about 56 per-cent) . . .	·4	40
Total	100·0	9,000

TABLE H.

"Workmen's Compensation Act, 1897."

Deaths—*Number leaving no Dependants, and number leaving Dependants.*

Census Returns '91:

Males over 18 years of age 7,135,321
„ „ married or widowed 4,448,529
i.e., 63 per-cent.

Factory Inspectors' Returns:

Males over 18 years of age 2,253,489
„ „ married or widowed (63 per-cent of total) 1,419,698
„ (total—all ages) 2,699,917
i.e., the married or widowed are 53 per-cent.

1. It was estimated that dependants other than wife or child would be left in . . . . . 10 per-cent of total

63 „ „

2. But that, although the deceased was married or widowed, no dependants would be left in . 7 „ „

56 „ „

Leaving the percentage of cases in which no dependants would be left . . . . . 44 „ „

TABLE I.

"Workmen's Compensation Act, 1897."

Cost per Case *in the several Classes of Accident expressed in terms of One Year's Wages (not of Benefit).*

Nature of Injury resulting from Accident	Compensation in Wages	Duration	Cost in one Year's Wages
Disablement:			
Temporary Total:			
Two weeks . . .	*nil*	...	...
Over two weeks . .	½ week's wages	4 weeks	·04
Permanent Partial . .	⅓ „ „	4 years	1·3
Permanent Total . .	½ „ „	14½ years	6·
Death:			
When deceased leaves no dependants . . .	£10	(does not apply)	·2
When deceased leaves relatives wholly or partially dependent . . .	3 years' wages	„ „	3·

TABLE J.

"Workmen's Compensation Act, 1897."

Cost of all the Cases in the several Classes of Accident expressed in terms of One Year's Wages, for the Employment of 100,000 *Men.*

Nature of Injury resulting from Accident	Cost of each Case in Year's Wages	Number of Cases	Total cost of Cases in Year's Wages
Disablement:			
Temporary Total:			
Two weeks	*nil*	5,400	*nil*
Over two weeks . . .	·04	3,191	127·64
Permanent Partial . . .	1·3	312	416
Permanent Total	6	27	162
Death:			
When deceased leaves no dependants	·2	30	6
When deceased leaves relatives wholly or partially dependent .	3	40	120
			831·64
			Equal to 16*s.* 8*d.* per £100 of wages

TABLE K.

"Workmen's Compensation Act, 1897."

Specimen Rates charged.

Textiles	£0	10	0	per £100 wages
Cabinet Makers (no circular saw risk)	1	0	0	,, ,,
Engineers (shop work)	1	10	0	,, ,,
Coal Merchants	2	0	0	,, ,,
Railway and General Contractors (excluding the erection of iron-work, tunnelling, or blasting)	2	10	0	,, ,,
Dock Service	3	0	0	,, ,,
Engineers—bridge building	3	10	0	,, ,,
Stevedores (on Clyde)	5	0	0	,, ,,

Remarks as to the position of Workmen in Cape Colony in regard to Legal Compensation for Injuries. *By* James McGowan, F.I.A., *Colonial Government Actuary.*

The only Act dealing with the subject of Employers' Liability in Cape Colony appears to be the following, namely, Act No. 35 of 1886, of the Cape Parliament, passed 6 July 1886.

Section 7 of this Act expressly declared, however, that the Act "shall take effect only within such mining areas as the Governor may "from time to time declare by proclamation to be published in the "*Gazette*", and it appears that the Act has only been put in force in the Diamond Mine District at Kimberley. This was done by proclamation in the year 1887.

The Act is entitled "An Act to extend and regulate the liability "of employers to make compensation for personal injuries suffered "by workmen in their service", and the Preamble states that "Whereas the law relating to the liability of employers to make "compensation for injuries suffered by workmen in their service is "at present vague and uncertain, and it is desirable to amend the "same, and to extend and regulate such liability: Be it therefore", &c.

Section 1 of the Act provides that if personal injury is caused to a workman (1) by reason of any defect in the works, machinery, &c., (2) by reason of the negligence of the employer or any person in his service, &c., &c., the workman, or in case the injury results in death, the legal representatives of the workman, shall have the same right of compensation and remedies against the employer as if the workman had not been a workman of, nor in the service of, the employer, nor engaged in his work.

Section 2 provides that a workman shall not be entitled to compensation in certain cases, such as where the workman knew of the defect or negligence which caused his injury, but failed to give information to his employer, &c.

Section 3 provides that the amount of compensation is not to exceed such sum as may be found to be equivalent to the estimated earnings, during the three years preceding the injury, of a person in the same grade employed during those years in the like employment, and in the district in which the workman is employed at the time of the injury.

Section 4. No workman to be entitled to recover compensation for any injury, under any other existing law in addition to the compensation under this Act.

Section 5. All actions to be commenced within six months after the occurrence of the injury for which compensation is sought.

It may be mentioned that the De Beers Diamond Mines at Kimberley has established a friendly society for its workmen, and that society pays a fixed sum in the case of the death of a workman from injuries in the mines.

Compensation to Workmen for Accidents in Russia.

By A. Pokotiloff.

Special legislation upon the liability of employers for injuries caused to workmen (as also to strangers) in Russia, exists only in respect to railway and steamship enterprises, and to Crown mining works; in respect, however, of industrial undertakings the general articles of the civil laws are applied, which concern, generally, compensation for injury and losses caused by crime or offence (Arts. 574, 644, 647, 657-661, 675 and 676 of the civil laws), and by acts not regarded as crimes or offences (Arts. 684, 685 and 687). In these articles, bearing a perfectly general character, are defined the modes of compensation of the sufferers themselves and of persons having the right to support from the sufferers, without precise indication of the extent of the compensation; the latter is determined at the discretion of the court, on the one hand, in proportion to the property of the person who has caused the injury, and, on the other, so that the sufferers may receive a sufficient maintenance and one, as far as possible, proper to the condition of the family. In the same manner are to be paid the expenses of medical attendance and burial of the sufferer; the members of the family left by the decease receive compensation either until such time as they obtain other means of subsistence or until the widow's re-marriage and the sons attaining their majority. The form of compensation is assistance paid annually, or at definite terms; at the same time in accordance with the general course of civil procedure, the *onus probandi* rests in Russia upon the plaintiff.

As far as regards the liability of the owners of railway and steamship enterprises, it is defined by Art. 683 of the Russian civil code.

In this article it is expressed that the owners of railway and steamship enterprises (the Crown, companies, and private persons) are bound to compensate every person who has suffered injury or loss in consequence of death or damage to health, caused in the working of railways and of steamship communications. These enterprises are relieved from the liability to compensate sufferers for injury or losses caused them, in such cases only where they

show that the accident occurred either in consequence of *force majeure* or without the fault of the management of the enterprise or of its agents. The managements of the said enterprises are forbidden to enter into previous private agreements or contracts, by virtue of which the managements would relieve themselves of the said responsibility; such contracts are by law regarded as null and void. The extent itself of the compensation depends exclusively on the degree of loss incurred in each separate case. This compensation is assigned, according to the desire of the sufferer, either in the form of a sum of money paid at one time or in the form of periodical assistance. Where compensation takes the form of periodical assistance, its extent may be increased or diminished in case of the discovery of new circumstances. The action for the assignment of compensation must be brought by the sufferer in the course of one year after the occurrence, if the accident took place on railways or internal water-ways; and in the course of two years, if it took place upon a steamer on salt water.

It hence appears that our law concerning accidents taking place in the working of railway and steamship enterprises, while imposing upon the sufferers the obligation of bringing the action, establishes that the *onus probandi* rests, not upon the sufferer, but upon the employer; the latter, in order to relieve himself from the payment of losses, must show that the accident occurred in consequence of *force majeure*, or not by the fault of the management of the enterprise or of its agents. The last expression "not by the fault of the management" must, however, be acknowledged to be not quite exact, and, in order to put it in a clear light, its actual signification, as understood by our courts, requires explanation. This expression should be understood not in the literal sense, that is, not so that, in order to relieve himself of a liability, it is enough for the employer to prove the absence of his own fault, but so that the employer is relieved of responsibility only in the event of the accident having taken place by the fault or negligence of the person who was killed or injured.

As an undoubted merit of our law must be regarded the prohibition it has established of employers entering into previous private arrangements in order to relieve themselves of the responsibility for injury or losses caused by accidents.

At the same time it is impossible not to observe certain defects in the law of liability quoted. The first such defect is that the compensation is given, not only in the form of periodical assistance, but also in the shape of a sum paid down at one time, since it is beyond doubt that pensions more effectually guarantee provision for the sufferers, who may easily yield to the temptation of expending money paid at one time unproductively, and in a comparatively short period; besides this, the very capitalization of the wages of the sufferer, with a view to determine the extent of compensation due, is not always carried out by the courts in a uniform and regular manner. In accordance with the practice adopted by our courts, in the case of complete loss of capacity to work, the sufferer is paid his wages, taken tenfold. Another defect in the law is the indefiniteness of the extent of compensation; such indefiniteness, while extremely inconvenient to the sufferers themselves, who never know beforehand upon what they can reckon, is, at the same time, harmful to the authority of the

courts, whose decisions, in perfectly similar circumstances, often depend on the greater or less amount of oratorical skill possessed by the advocates.

A somewhat new principle in our legislation on compensation for injury in regard to railways was introduced by the law of the 30 May 1888, for the establishment of Pension Funds on the railways.

This law, obliging the Pension Funds established on the railways to give compensation to the servants and workmen who have suffered injury, or the members of their families, in the first place entirely removed the question of the fault of the sufferer himself, whether the result was death or injury. It established the duty to give compensation for an accident, from whatever cause the same took place, if only the case occurred during the performance by the sufferer of his duties as servant of the company. Another innovation concerns the form of compensation; the law of 30 May 1888, defines that compensation is payable only in the form of an annual pension to the person who has suffered the injury, or to his family, proportionate to the extent of the injury.

It is matter of regret that this special law has not altered the general law on the liability of the owners of railway enterprises, expressed in Article 683, but operates concurrently with the latter. Therefore, servants, desirous of receiving a sum of money down instead of a pension, are always able to apply to the court and demand, in virtue of Article 683, compensation in a single payment. Sufferers, not conscious of the total unreasonableness of such a form of compensation, thereby yield to the temptation of the expected receipt of a large sum paid at one time, and refuse compensation in the form of pensions, which is far more consonant with their actual interests. In the case of the payment of more or less large sums at one time, as experience has shown, a wide field is opened for the activity of a certain kind of intermediary, who, in the majority of cases, retains in his own hands in the form of a fee a very considerable portion of the compensation awarded the sufferer.

Therefore, at the present time, there exists a proposal to establish by legislative enactment that the compensation for death and injury, taking place in consequence of accidents on railways, shall be necessarily given, only in the form of pensions; besides this, it is proposed to fix also the amount itself of such pensions, namely, to assign, in case of complete incapacity for work, a full year's wages, and, in case of partial incapacity, from one-third to three-quarters of a year's wages, in proportion to the degree of injury; to give the widow of the deceased half the pension, to which the injured himself had a right, to each child 15 per-cent, and to each orphan 22·5 per-cent of the same pensions, it being understood that the pensions to widow and children together do not exceed 75 per-cent of the pension of the sufferer himself.

The right to compensation of the injured in the case of workmen in Crown mining works, was established in the law of 1861 (on Crown mining works). By Article 70 of this law, it is declared

that " workmen made incapable of continuing their ordinary employ-
" ments in consequence of injury received by them in the performance
" of their duties in a mine, or at mining works, as also the widows and
" children of workmen who have died in consequence of the
" injury they have received, receive pensions from the Government."
Neither in this Article nor anywhere else in the law of 1861, on the mining population of Crown mining works, is there any mention at all of the cause of the accident resulting in the death or injury, that is, the pensions must be paid in every case, in virtue of the existence alone of the injury.

We see, thus, that in Russia, already more than 35 years ago in a special law was introduced the principle of trade risk, on the establishment of which, up to the present time, discussions are still going on in many Western European States.

Among the legislative labours of our country in regard to the question of the compensation of workmen for accidents, it is impossible to pass unnoticed the scheme of the Ministry of Finance upon this question, drawn up in the year 1893.

This projected law, concerning the liability of the owners of manufactories and works, railway and other workshops, mining industries, as likewise the contractors for building works, introduces in fairly wide limits the principle of trade risk; in accordance, then, with the scheme, employers are relieved from liability for accidents to workmen in that case only where they shall show that the cause of the accident was *force majeure*, or crime, or offence, committed by a person not connected with the enterprise, or exclusively and immediately the fault of the sufferer.

Compensation alike to the sufferer and to his family is assigned in the form of pensions, bearing a relation per-cent to the last annual wages, and for children and minors to the average wages of adults in respect of the same kind of work, with the observance of the following rules:

(*A*) In the case of death is paid:

(1) Compensation for expenses incurred for medical treatment of sufferer;

(2) Burial assistance to the amount of not more than *R*.20 for adults and *R*.10 for children;

(3) To the surviving relations of the deceased:

(*a*) To the widow: a life pension to the amount of 30 per-cent of the wages of the deceased (until her marriage);

(*b*) To the young children of both sexes, a pension until the attainment of the age of 15 years inclusive, 15 per-cent each during the life of one parent, and to orphans bereft of both parents, 25 per-cent of the parent's wages each;

(*c*) To the parents of the sufferer, a pension of 15 per-cent each, if they were being supported by him. All these pensions together may not exceed 60 per-cent of the wages of the deceased.

(*B*) In cases of injury, or of such damage to the health of the sufferer as leads to temporary or permanent incapacity the work, beyond defraying the expenses of medical treatment, life pensions are assigned to an amount corresponding to the deterioration in working capacity, or to the extent of the full wages in the case of complete incapacity for work. These pensions may be diminished within the limits of three-quarters and one-half of the normal amount in cases of joint fault of the sufferer and of the owner of the enterprise. The superior limit of wages taken into account in the determination of the amount of the assistance is defined as *R.*1,200.

Attention may be directed further to the following details of this projected law:

(1) The action for compensation must be brought in the place where the enterprise is situated, and not in the place of residence of the defendant, as is in general established by our law; thanks to this, it will be easier for the court to investigate the causes of accidents;

(2) All kinds of agreements precedent to the accidents, tending to limit the rights of workmen to receive compensation and its amount, are regarded as of no effect. Subsequent voluntary agreements, although they are admitted, yet, as a condition of their validity, require to be clothed in a written form and to be certified by the rural chief (Zémskinachalnik), or by the justice of the peace, or city judge; the latter may refuse to certify, if they regard the contract as manifestly infringing the interests of the suffering parties;

(3) With the object of encouraging assurance, the projected law establishes that, if the owner of the enterprise participated in the payment of the assurance premiums in behoof of his workmen, he is then entitled to reckon to the account of the compensation accruing to the sufferer the assistance which will be given him from the Assurance Funds or Institutions, in proportion to the share of his participation in the assurance premiums.

There is no doubt but that the State Council, the supreme legislative institution in Russia, for whose consideration the above-mentioned project has been presented, will devote to it all the attention which the grave importance of the question concerned merits.

The results of the activity of private assurance companies in Russia for the assurance of workmen against accidents could not up to the present time be of importance, in the first place, because assurance companies have but lately begun to occupy themselves with this business, and, in the second, in consequence of the circumstance that the owners of industrial undertakings with us have no special need to have recourse to this assurance, seeing that their liability, according

to the general civil laws, is too insignificant. The prevailing form consists in the assurance to the workmen of compensations paid in one sum calculated on the daily wage of the workmen, increased generally to the extent of 500 to 1,000 times. This compensation may be changed into a pension by means of its simple conversion into such a life annuity as may be assured the sufferer (in accordance to his age) by means of a simple payment of the sum corresponding to the compensation. The extent of compensation to disabled workmen is conditioned by the degree of diminution of the working capacity of the sufferer, with a sub-division into complete and partial loss of capacity for work. In case of death, the assured amount is paid to the family of the deceased. Over and above this, assurance is further taken for assistance in the case of temporary illnesses, when this assistance is given generally in the proportion of half the daily wage, but not for less than ten days and not for more than two hundred days of sickness. The undertakings, in which the assured servants or workmen are occupied, are divided, according to danger, into several classes, and for each class is established a certain assurance premium. In general the premiums are rather high. Latterly assurance companies have begun to conclude assurances with liability to the owners for the payment of those sums which may be awarded from the owners by the courts for the compensation of the sufferers.

Of the five companies carrying out assurance against accidents, the greatest operations belonged to the "Russia" Company (in which at the present time are about 230,000 persons assured).

Quite recently, namely, the 30 January of this year, witnessed the confirmation in legislative course of the "Statute of the Riga "Company for the mutual assurance of manufacturers and tradesmen "against accidents to their workmen and servants."

This company assumes the civil liability of its members for the death, injury, and other damage to health caused a workman or servant by an accident, which has occurred in consequence of the course of industrial enterprises entering into the composition of the company. The company is relieved of liability in those cases where it shall show that the cause of the infliction of the injury to the sufferer is:

(1) The action of an irresistible external or elemental force, which it was impossible to foresee and to prevent; or,
(2) The crime or offence of persons not connected with the industrial undertaking; or,
(3) Such intentional acts of other workmen as do not result from the essence of the works in the enterprise; or,
(4) The sufferer's own gross fault.

Members of the company may be, in the person of their owners and legal representatives, industrial undertakings having not less than two workmen or servants. The company opens its operations provided there enter it at least thirty undertakings, having not less than 10,000 workmen and servants. A member of the company, besides the exact performance of the requirements established by the law or by special orders of the Government in regard to the carrying on of works in industrial enterprises, is bound in particular to take, in avoidance of

accidents, the measures of precaution prescribed by the management of the company. In the contrary case, the management has the right to raise, within limits assignable by a general meeting, the assurance premium accruing from the member, and in the case of further disobedience, to propose to a general meeting the exclusion of the member.

If the sufferer or his successors shall bring an action against a member of the company, the management assumes all the expenses and cares in respect of conducting the suit in the court and administrative institutions.

The company pays the sufferer compensation to the amount defined by the decision of the court, if, in regard to the satisfaction of the sufferer for losses, caused by accident, there has been such a decision; in the absence, however, of it, the compensation is determined on the basis of the following rules:

(1) In the case of complete loss of capacity for work, the sufferer is paid a life annuity to the amount:

  (*a*) Of his entire last year's wage, if this did not exceed *R.*240; and,

  (*b*) Two-thirds of the same wage to bachelors and women, and 75 per-cent of the same wage to family workmen of the male sex, but not less than *R.*240 in the case of annual wage exceeding this sum;

(2) In the case of partial loss of capacity for work, the degree of capacity for work of the sufferer is determined in percentages, and the sufferer has the right to receive the proportional part of that annuity which would accrue in the case of complete loss of capacity for work;

(3) If the workman or servant is killed at work, his family is paid compensation in the form of an annuity, the yearly amount of which is determined according to the following calculation:

  (*a*) To the widow or widower, if the latter on account of the state of his health is himself incapable of earning his livelihood, to the extent of 30 per-cent of the annual wage of the person killed, while the payment of the annuity ceases with re-marriage;

  (*b*) To young children of both sexes, 15 per-cent of the same wage during the life of one of the parents, and 20 per-cent to those left complete orphans; the payment of this annuity ceases on the attainment of the age of 15 years; and

  (*c*) To the parents of the deceased, if they were being supported by him, 15 per-cent of the above-mentioned wage to each.

All the annuities above named, taken together, may not exceed 60 per-cent of the last yearly wage of the person killed, while the relations in the ascending degree have the right to the annuity only in the case, and in the share, when and whereby the sum total of the payments to the remaining

members of the family falls short of 60 per-cent. If the total sum of the payments exceeds 60 per-cent, the payment to each member in particular of the family, with the reduction of their total sum to 60 per-cent, are diminished in a like degree. Persons having the right to receive from the company a life annuity are allowed, instead of this annuity, to demand the payment of a corresponding capital sum.

4. In case of temporary incapacity for work from accident, if it was the subject of assurance and continued more than five days, compensation is paid in the amount of half the full daily wage, while in each separate case it depends on the discretion of the company to raise the extent of compensation indicated, taking into consideration the family and pecuniary position of the sufferer, but not, however, in excess of his full daily wage. If, further, the sufferer was under treatment in a hospital, and his support in the latter was free, the company may make a deduction from the sums payable corresponding to the savings, resulting from the support in hospital, in the household of the sufferer.

The assurance premiums are determined by a general meeting of the members. If the annual income of the company proves insufficient to cover all expenses, in respect of carrying on the business, towards the payment of the compensations for losses, and the deductions of the reserve fund for pensions payable, the amount requisite for this purpose is supplemented from the reserve capital. In the case, however, of the inadequacy of the reserve capital, the sum wanting is distributed over all the members of the company in the shape of supplementary assurance payments, in proportion to the assurance premium payable by each of them, while the extent of these payments is determined by a general meeting. In case the management of the company, albeit in the middle of the year, shall see that, to cover the losses of the company and the deductions to the reserve fund in respect of the pensions that have emerged, there will be required from the members a supplementary assurance payment exceeding the payment of each of them, it is bound to immediately summon an extraordinary meeting, which decides: (1) whether the operations of the company should be continued; (2) whether the affairs of the company should be completety liquidated; or (3) whether the further acceptance of assurance of a separate kind of industrial undertaking should be discontinued.

The above quoted statute of the Riga Company has been recognized by our Government as a standard for this kind of organization, while, after the model of this statute, the Minister of the Interior, in agreement with the Minister of Finance, has been authorized to confirm other like statutes.

In view of the still comparatively feeble development in Russia of manufactory and mill industry on a large scale, the question of the assurance of workmen against accidents is mainly, of course, a thing of the future, and does not possess that pressing character which it

has acquired lately in the West. Herein consists an extremely important advantage for us. Not being compelled by the urgent demands of life to hurry the solution of such a complex question, we are enabled the more carefully to discuss it from every point of view, while availing ourselves, at the same time, of the valuable experience for us of our western European neighbours.

In any case, already, on the basis of that which has been partly done in this respect by our legislation, the main features of which we have examined above, I presume that the hope may be entertained that the decision of the question of compensation to workmen for accidents will be established in Russia on those rational bases which theory has succeeded in elaborating; thus we see that in our country is observed the tendency to establish, as the general principle, trade risk; there is observed a striving to transfer the *onus probandi* from the sufferer of the injury to the employer; the question of compensation is, at times, made independent of judicial consideration by means of the exact definition beforehand of the extent of the compensation; it has been recognized as desirable to give the compensation itself only in the form of pensions; previous agreements are prohibited, which might enable employers to avoid liability, and the necessity therefrom flowing to pay compensation, and so on.

And yet, in whatever shape the question of compensation to workmen for accidents should be finally decided in Russia, whether by means of State assurance or in private companies, whether by means of enhancing the liability of employers for accidents to their workmen, in every one of these forms it will be impossible to avoid meeting the financial side of the matter, that is, the question of the extent of the expenditure called forth by the compensation of the sufferers, and of the means of covering this expenditure.

There is full reason to hope that our Government, in this respect also, will direct due and serious attention to the regular solution of this question, in accordance with the scientific demands of assurance. Of this we are convinced, by a whole series of legislative Acts of recent date, seeing that our highest legislative institution, in the decision of separate questions from the region of social legislation, has always shown a particular care for the financial solidity of the measures undertaken. By way of example of such care may be cited the organization of the Pension Funds for railway servants upon the scientific principles of assurance, the review of various kinds of banks, not founded on the principles of life assurance, and so on.

But, in order to place upon a perfectly firm basis the financial side of such an important matter, as is the compensation of workmen for accidents, it is necessary, first of all, to have exact statistics of these accidents, which alone can furnish trustworthy material for the regular and scientific solution of the question. It is impossible not to acknowledge that in this respect up to the present time very little has been done, alike among us in Russia and abroad. If in separate countries the collection of such data has been commenced, yet nothing has so far been done in the direction of the simultaneous institution of the statistical observation of accidents in all European countries generally, in accordance with any uniform plan; while the institution of such observation would be extremely desirable, as it

would yield the proper material for the regular solution of the question of compensation to workmen from the technical assurance point of view.

I presume that the Congress of Actuaries might in this respect render a signal service to the cause of the solution of the question of compensation to workmen, if it were to assume—as suggested by the President of the Permanent Committee, Mr. O. Lepreux—the labour of establishing a certain system of observation in accordance with a fixed plan and of regular elaboration of the corresponding material. The indications of the Congress would undoubtedly be taken advantage of, especially by those countries in which, as with us in Russia, the question of compensation to workmen has not yet been decided.

Die Arbeiter-Unfallversicherung in Österreich, Von Karl Kögler, *Director der Arbeiter-Unfallversicherungsanstalt für Niederösterreich in Wien.*

Die Arbeiter-Unfallversicherung in Österreich wurde durch das Gesetz vom 28 December 1887 eingeführt und durch das Gesetz vom 20 Juli 1894 erweitert. Der Versicherungspflicht unterliegen nach dem Ersteren "alle in Fabriken und Hüttenwerken, in Bergwerken auf " nicht vorbehaltene Mineralien, auf Werften, Stapeln und Brüchen, " sowie in den zu diesen Betrieben gehörigen Anlagen beschäftigten " Arbeiter und Betriebsbeamten." Dasselbe gilt von Baubetrieben, dann von Betrieben, in welchen explodirende Stoffe erzeugt oder verwendet werden und von jenen gewerblichen oder land-und forstwirtschaftlichen Betrieben, bei denen Dampfkessel oder durch elementare Kraft oder Thiere bewegte Triebwerke in Verwendung kommen, ausgenommen jene Fälle, in welchen eine nicht zum Betriebe gehörige Kraftmaschine benutzt wird.

Das Gesetz vom 20 Juli 1894 dehnte die Versicherungspflicht insbesondere auf die Eisenbahnen, den sonstigen gewerbsmässigen Transport von Personen und Sachen zu Land und auf Binnengewässern, die gewerbsmässige Warenlagerung, die Theaterunternehmungen, die Berufsfeuerwehren, dic Unternehmungen für die Reinigung der Strassen, Häuser, Rauchfänge und Canäle aus.

Die Beschränkung Der Versicherungspflicht in der Landwirtschaft auf die bei den motorisch betriebenen Maschinen Beschäftigten während der Dauer dieser Verwendung bedingt ebenso eine Bevorzugung gegenüber den sonst unversicherten landwirtschaftlichen Arbeitern, wie eine ausserordentliche Steigerung des Unfallsrisicos und die Uncontrollirbarkeit der Betriebe betreffs der Betriebszeit, demnach der zur Verrechnung kommenden Löhne. Aehnliche Nachtheile werden durch die Beschränkung der Versicherungspflicht der Baugewerbe einschliesslich der sogenannten baulichen Nebengewerbe (Bauschlosser, Bautischler, etc.) auf die Verwendung bei dem Baubetriebe selbst gezeitigt. Desgleichen schliesst die Versicherungspflicht der motorisch betriebenen kleingewerblichen Unternehmungen die Arbeiter im übrigen kleingewerbe trotz der dort oft höheren Unfallsgefahr aus, anderseits behindert sie die Einführung von Motoren in kleingewerblichen Betrieben, also die staatlicherseits geförderte Ausdehnung der rationnellen motorischen Betriebsweise. Einem Theile dieser Unzukömmlichkeiten wird bei einigen Unfallversicherungsanstalten,

so auch bei jener für Niederösterreich durch Uebernahme der Beitragsleistung für die bäuerlichen landwirtschaftlichen Betriebe auf Landeskosten gesteuert, ebenso wie dasselbe auch betreffs der kleingewerblichen Betriebe durch einen Antrag des Abgeordneten Rudolf *Kitschelt* für Niederösterreich angestrebt wird.

Die österrieichische Unfallversicherung ist *territorial* organisirt, die Errichtung von Berufsgenossenschaften, deren eine, die Berufsgenossenschaft der Eisenbahnen, besteht, ist zulässig, wenn durch deren Errichtung die dauernde Leistungsfähigkeit einer oder mehrerer Territorialanstalten, deren es 7 gibt, nicht gefährdet erscheint. Die im Gesetze vorgesehene Erschwerung der Zulassung von Berufsgenossenschaften ist zweckmässig, weil sonst die Territorialanstalten nur die kleinen, minder zahlungsfähigen und die mit hoher Unfallsgefahr behafteten gröszeren Betriebe behalten würden, also einen ihrer Vortheile, den Riskeuausgleich, verlieren müssten. Das Territorialprincip bietet die Möglichkeit der rationellen Angliederung der übrigen Versicherungszweige d.i. der Kranken- und der Alters- und Invaliditätsversicherung, also der *Vereinheitlichung der Arbeiterversicherung*, worauf die Bestrebungen der Socialversicherer gerichtet sein müssen. Hiebei sollte aber nicht Halt gemacht werden, der Endpunkt der Entwickelung auf organisatorischem Gebiete ist die *Schaffung einer selbständigen socialpolitischen Organisation des Staatsgebietes* ebenso wie es dermalen eine Eintheilung in politische Verwaltungsprengel gibt.

Es sind locale Arbeitsämter zu schaffen, welche alles zu besorgen haben, was dem Arbeiterschutze im weitesten Sinne des Wortes dient; sie haben also ebenso die Aufgaben der Gewerbe-Inspection zu erfüllen, wie die local zu besorgenden Geschäfte der Arbeiterversicherung d. i. insbesondere die Krankenversicherung (Versicherung für vorübergehende Erwerbsunfähigkeit) für alle in dem Bezirke befindlichen Versicherten, dann die Erhebungen für die Unfall-und Invaliditätsversicherung (Versicherung für dauernde Erwerbsunfähigkeit) durchzuführen; ebenso sammeln sie die arbeitsstatistischen Daten, etc. Hiedurch wird die Wirksamkeit der Gewerbe-Inspectoren mit den Aufgaben der Socialversicherung in einer beiden Theilen zum Vortheile gereichenden Art innig verknüpft, so dass die Ersteren, welche ihre Thätigkeit auf kleine Bezirke zu beschränken haben werden, zum Mittelpunkte des gesammten Arbeiterschutzes in dem Bezirke gemacht werden. Für gröszere Sprengel werden Aufsichtsbehörden geschaffen, welche gleichzeitig die Geschäfte der Versicherung für dauernde Erwerbsunfähigkeit zu besorgen haben, insoweit sie nicht als localer Natur von den Bezirks-Arbeitsämtern erledigt wurden. An der Spitze der Organisation steht ein Central-Arbeitsamt, das gleichzeitig als oberste Recursbehörde im administrativen und gerichtlichen Verfahren dient.

Die sämmtlichen Organe des Arbeiterschutzes haben staatlichen Charakter, werden also vom Staate verwaltet und erhalten. Die Interessenten (Arbeitgeber und Arbeitnehmer) sind jedoch zu weitgehender Mitwirkung durch von beiden Gruppen in gleicher Zahl gewählte Vertreter heranzuziehen; hiebie wird ihnen insbesonders betreffs der Beitragsbemessung, Entschädigungsfestsetzung und Fondsanlage ein beschliessendes Votum einzuräumen sein.

Die Entschädigung beträgt dermalen bei gänzlicher Erwerbsunfähigkeit 60 % des Jahresarbeitsverdienstes, bei theilweiser Erwerbsun-

fähigkeit einen Bruchtheil dieser Vollrente mit dem Maximum von 50 % des Jahresarbeitsverdienstes. Im Todesfalle sind die Beerdigungskosten nach Ortsgebrauch mit dem Höchstbetrage von fl. 25 zu ersetzen, und der hinterbliebenen Witwe bezw. dem erwerbsunfähigen Witwer 20 %, jedem ehelichen Kinde 15 %, und bei vollständiger Verwaisung 20 %, jedem unehelichen Kinde 10 % des Jahresarbeitsverdienstes und zwar stets bis zum vollendeten 15. Lebensjahre zu gewähren; diese Renten dürfen 50 % des Jahresarbeitsverdienstes nicht übersteigen. Ascendenten des Verstorbenen gebührt eine Rente von 20 % des Jahresarbeitsverdienstes dann, wenn sie bedürftig sind und der Verstorbene ihr einziger Ernährer war; wenn neben den zuerst genannten Hinterbliebenen bezugsberechtigte Ascendenten vorhanden sind, so erhalten diese nur insoweit Renten, als der Gesammtbetrag der an die Ersteren zugebilligten Renten 50 % des Jahresarbeitsverdienstes nicht erreicht.

Es empfiehlt sich, wenige Erwerbsunfähigkeits-und sohin Renten-Grade einzuführen, welche bei der anzugliedernden Invaliditätsversicherung im Invaliditätsfalle desgleichen und zwar mit zunehmenden Beschäftigungsdauer aufsteigend zuzubilligen sind, ein Gedanke, der nach Wissen des Referenten in der schwedischen Arbeiterversicherung gemäss dem Entwurfe des Professor Dr. Andreas *Lindstedt* ausgesprochen wurde.

Im Gegensatze zu dem *Umlageprincipe*, bei welchem das Erfordernis jedes Jahres durch die Versicherungsbeiträge aufzubringen ist, wurde in Österreich das *Capitaldeckungsprincip* angenommen, dem zufolge die Versicherungsbeiträge jedes Jahres das gegenwärtige und künftige Erfordernis, welches aus den Unfällen des Jahres sich ergibt, nebst den sonstigen Ausgaben des Jahres zu bedecken haben. Die Reservefondzuschläge des deutschen Umlageverfahrens sind eine Concession an das Deckungsprincip und das Zugeständniss, dass mit der reinen Umlage das Auslangen nicht gefunden werden kann.

Die Auftheilung des Versicherungsbeitrages auf die einzelnen Betriebe erfolgt nach Massgabe der Lohnsummen und der Betriebsgefahr; letzteres geschieht durch die Gefahrenclassification, welche in fünfjährigen Perioden revidirt wird, und den Beitragstarif, den die Versicherungsanstalt ihren Bedürfnissen anzupassen hat.

Die Revision der Gefahrensclassification erfolgt seitens des Ministeriums des Innern unter Berücksichtigung der gewonnenen statistischen Erfahrungen.

Der einzige wesentliche Unterschied zwischen Umlage-und Capitaldeckungsprincip besteht nicht in einem Mehr oder Minder der Beitragsleistungen, sondern in der Verschiedenheit der zeitlichen Vertheilung der Beitragslasten; das Umlageverfahren überwälzt die Lasten der Gegenwart auf die Zukunft, wodurch die Neuerrichtung und die Vergrösserung von Unternehmungen in späterer Zeit erschwert wird und die Industrie in Jahren des Rückganges, in Kriegszeiten, also dann, wen sie der grösten Schonung bedarf, am schwersten betroffen werden muss. Für kleinere, dann für temporäre Betriebe ist das Umlageverfahren aus den vorerwähnten Ursachen unanwendbar, wie denn im deutschen Reiche, welches sonst das Umlageprincip acceptirte, für die auf Grund des Bau-Unfallversicherungsgesetzes bestehenden Berufsgenossenschaften und ebenso

für die seinerzeit vorgeschlagenen Unfallversicherungsgenossenschaften des Kleingewerbes, die gleich den bestehenden landwirtschaftlichen Berufsgenossenschaften Territorialanstalten werden sollten, das Capital-Deckungsprincip vorgesehen wurde.

Das Umlageverfahren erschwert zufolge der fortgesetzten und lange andauernden Steigerung der Beitragslast den Ausbau und die Vereinheitlichung der Arbeiterversicherung durch Angliederung der Invaliditätsversicherung, denn es beträgt gemäss der Denkschrift zu der deutschen Regierungsvorlage betreffend die Abänderung des Alters- und Invaliditätsversicherungsgesetzes vom Jahre 1896 die Entschädigungslast

(*a*) bei den gewerblichen Berufsgenossenschaften
1894 0·907 % des Lohnes oder 5·93 Mark pro Versicherten.
1950 3·239 % „ „ „ 21·20 „ „ „
(*b*) bei den landwirtschaftlichen Berufsgenossenschaften
1894 0·70 Mark und 1950 3·45 Mark pro Versicherten.

Der bedeutende Betrag, welcher zur capitalischen Bedeckung der Verpflichtungen der deutschen Berufsgenossenschaften nach derselben Quelle (1900, 273 Millionen Mark) fehlt, hindert die Vereinheitlichung der Arbeiterversicherung in Deutschland. Mit Recht wurde einst in England gesagt, dass *in* das Umlageverfahren viele Wege führen, aber keiner *heraus*.

Der Hinweis auf die ungünstige Beeinflussung des Zinsfusses durch Festlegung grosser Capitalien in pupillarsicheren Anlagewerthen ist ebenso angesichts der unbedeutenten Beträge (Ende 1896, also des 7. Verwaltungsjahres betrugen die Deckungscapitalien der österreichischen Unfallversicherungsanstalten rund fl. 29,683,500), wie auch, abgesehen von einer Reihe von Gegengründen nationalökonomischer Natur, zufolge des Umstandes unzutreffend, dass mehrere Versicherungsanstalten im Begriffe sind, ihre Fonde den Zwecken der Industrie und zwar vorläufig durch Erbauung von Arbeiter-Wohnhäusern an Orten des Bedarfes dienstbar zu machen.

Die beiden Grundprincipien des österreichischen Unfallversicherungsgesetzes, *Territorialität* und *Capital-Deckungsverfahren*, welche den beiden Schöpfern des Gesetzes Emil *Steinbach* und Julius *Kaan* zu danken sind, fanden in Norwegen Nachahmung und wurden auch in den Gesetz-Entwürfen der Schweiz und der Niederlande vorgesehen.

Der Congress tagt in London, der Metropole des britischen Weltreiches, des classischen Landes der Selbsthilfe. Werden demnach, betreffs der Durchführung der Arbeiterversicherung in dem Kreise der Congressmitglieder verschiedene Ansichten vertreten sein, so sind doch Alle darin einig, dass es zu den grundlegenden Aufgaben des modernen Staates gehört, diejenigen seiner Bürger, welche von ihrem Arbeitsverdienste zu leben gezwungen sind, gegen die Wechselfälle des Lebens thunlichst sicher zu stellen.

Translation.

Workmen's Accident Assurance in Austria. *By* Karl Kögler, *Vienna, Director of the Workmen's Accident Assurance Establishment for Lower Austria.*

Workmen's accident assurance in Austria was introduced by the law of the 28th December 1887 and extended by the law of the 20th July 1894. According to the former of these laws, the following persons are subject to compulsory assurance, namely: "All workmen and "officials employed in manufactories, foundries, mines (those for certain "minerals excepted), wharves, shipworks, quarries, and all localities "appertaining to these works." The same provisions apply to building works, and to industries in which explosive substances are either manufactured or made use of, as well as to those industrial pursuits, including agriculture and forestry, in which machines worked by steam, wind, water, or animal power, are employed, except in those cases in which a machine, not belonging to the concern, may be temporarily made use of.

The law of the 20th July 1894 extended compulsory assurance especially to railways and other means of transport of persons and goods by land or on inland waters, the storage of goods, theatrical undertakings, fire prevention, and those engaged in the work of cleaning streets, houses, chimneys, and canals.

The limitation of compulsory assurance in agricultural pursuits to those concerns which make use of machinery driven by motive power during the continuance of such use, is the cause, on the one hand, of an unfair preference, to the otherwise uninsured agricultural labourers, and, on the other hand, of an extraordinary increase in the risk of accident, and makes it impossible to control the undertakings, as regards the periods during which the wages have to be taken into account. Similar disadvantages arise from the restriction of compulsory assurance in the building trades, including the so-called allied occupations (*e.g.*, locksmiths, carpenters, &c.) to the time of their employment in building work. In the same manner, the compulsory assurance required in small undertakings in which motive power is made use of excludes the workmen in other small concerns, in spite of the fact that the risk of accident is frequently higher in these latter. Further, this provision tends to hinder the introduction of motive power into small workshops, and, therefore, the extension of the reasonable employment of motive power which is desired by the State. These disadvantages are, to a certain extent, modified in some of the institutions for accident assurance, including that for Lower Austria, by their undertaking the payment of the contributions for the small agricultural industries at the expense of the country districts (*i.e.*, provinces); and, at the same time, the deputy Rudolph Kitschelt is endeavouring to introduce the same system of payment of contributions for the smaller industrial undertakings in Lower Austria.

The organization of accident assurance in Austria is *territorial.* The establishment of trade associations (only one of which, that of the railways, is in existence) is only permitted in cases where it appears that the business of one or more of the territorial institutions, of which there are seven, would not be in danger of being injured. The restriction of the general sanction of trade associations, as provided in the law, is necessitated by the fact that otherwise the territorial institutions would only retain the business of the smaller concerns, the income from which would be slight, or, of the larger works, only those where the danger of accident was exceptionally great, and would thus lose one of their greatest advantages—the equalization of risks. The territorial system affords an opportunity for the affiliation, on suitable terms, of other branches of assurance, namely, assurance against sickness, infirmity, and old age, and thus renders possible the unification of workmen's assurance—a goal to which the endeavours of all advocates of social assurance are necessarily directed. In this direction, however, we must continue the forward movement. The object of development in the sphere of organization is the establishment of an independent social-economic organization of the State as a whole, just as there exist at present territorial divisions for administrative purposes. Local labour boards must be created whose duty it will be to provide for everything which, in the widest sense of the word, appertains to the protection of the workmen. They will, therefore, have to fulfil the duties connected with the inspection of factories, as well as to look after the local affairs of the workmen's assurance, *i.e.*, first the sickness assurance (assurance against temporary disablement) for all the assured persons to be found in their respective districts. They will also see to the inquiries and researches necessary for ascertaining the facts and the degrees of accidents and infirmity in the assurance against permanent disablement, and, further, will collect statistical data, &c. By these means, the labours of the inspectors of factories will be thoroughly combined with the business of social assurance in a manner which will be advantageous to both, so that the former, who will have to restrict their activity to small districts, will become centres in each district of the general system of workmen's protection. For larger districts, inspecting authorities will be constituted, who, at the same time, will have the duty of conducting the business of assurance for chronic disablement, in so far as it is not discharged by the boards of the small districts, as being of a local nature. At the head of the organization is a central board which serves as the highest authority, both in administrative and judicial proceedings.

All the organizations of the workmen's assurance have a national character, and are therefore protected and supported by the State. The interested parties (employers and employed) are, nevertheless, drawn into a far-reaching co-operation by means of representatives elected by both groups in equal numbers. In this connection, the right of deciding by vote, especially in matters concerning the amount of the contributions, of compensation in cases of injury, and disposal of the funds, must be accorded them.

In cases of total incapacity for work, the allowance amounts to 60 per-cent of the yearly wages; where the incapacity is only partial, a fraction of the foregoing, up to a maximum of 50 per-cent of the

wages. In case of death the funeral expenses, according to local usage, are defrayed to an amount not exceeding 25 fl., and the following allowances are payable to the survivors. To the widow, or the widower (the latter only if he is incapacitated from work), 20 per-cent of the wages; to each legitimate child 15 per-cent, and if the child has lost both parents, 20 per-cent; to each illegitimate child, 10 per-cent. These allowances are payable until the children have attained the age of 15, but must not exceed 50 per-cent of the wages altogether. Progenitors of the deceased are entitled to 20 per-cent of the wages, if they are in necessitous circumstances, and the deceased was their sole support. Besides the survivors named above (*i.e.*, widow, widower, children) should there exist progenitors, who would appear to be entitled to assistance, they can only receive an allowance, in case the total payments to the survivors already specified do not amount to 50 per-cent of the wages.

It is desirable to introduce only a few degrees of incapacity for labour, and consequently of allowances to be made in cases of such incapacity in the assurance against infirmity, which will be affiliated to that against accident. The allowances will necessarily increase in amount with the length of time of the occupation of the assured. This idea was expressed for the first time, as far as I am aware, by Professor Andreas Lindstedt, in the Bill for workmen's assurance in Sweden.

In contradistinction to the assessment system, according to which the requirements of each year are to be provided by contributions levied during the year, the principle of accumulating funds sufficient to cover future liabilities has been adopted in Austria, in consequence of which the year's contributions have to provide, not only for the claims falling due in the course of the year, with the other expenses, but also to provide a fund to cover the future risks undertaken during the year. The formation of reserve funds in connection with the German assessment system is a concession to the above principle, and an admission that assessment pure and simple is insufficient for its purpose.

The apportionment of contributions to the various industries is made in proportion to the wages paid and the risk of accident incurred. As to the latter, a classified table of risks is drawn up, which is subject to revision every five years, as well as the tariff of contributions, which the assurance institution has to modify according to its requirements.

The revision of the classification of risks is made by the Minister for the Home Department, taking into account the experience derived from statistical observations.

The only substantial difference between the system of assessment and that of accumulating funds, consists, not in the payment of greater or less contributions, but in their different methods of apportioning the burdens as to the present time and the future. The assessment system hands over the burdens of the present to futurity, in consequence of which the establishment of new undertakings and the enlargement of existing ones in time to come is rendered more difficult, and a great strain must be put upon industry in years of depression, or in time of war; that is, just when it needs the greater consideration. The assessment system is, for reasons already given, quite unsuitable for small, or for temporary businesses, and in the German Empire, where otherwise this system is accepted, the

principle of accumulating funds is applied to existing associations carried on in accordance with the law concerning accident assurance in the building trades, and also to proposed accident assurance associations of small industries, as well as to the existing territorial trade associations of the agricultural class.

The assessment system, by reason of the long-continued increase in the burden of contributions, hinders the extension and the unification of workmen's assurance through affiliation of the assurance against incapacity, for (according to a memorial laid before the German Government concerning the proposed amendment of the law regulating assurance against old age and incapacity) the cost of compensation works out as follows:

(*a*) In industrial trade associations:
1894, 0·907 per-cent of the wages, or 5.93 marks for each person assured;
1950, 3·239 per-cent of the wages, or 21.20 marks for each person assured.

(*b*) In agricultural trade associations:
1894, 0.70 marks for each assured person;
1950, 3.54 marks for each assured person.

The large amount which, according to the same authority, will be necessary to cover the obligations of the German trade associations (estimated in 1900 at 273 millions of marks), hinders the unification of the workmen's assurance in Germany. Someone in England has said, with perfect truth, that many roads lead *to* the assessment system, but none *out* of it.

The allusion to the unfavourable effect upon the rate of interest which would be caused by locking up large amounts of capital in first-class securities, as trust funds, is also inconclusive, in view of the insignificant amounts involved (at the end of 1896, their seventh year, the total capital of the Austrian accident assurance institutions amounted, in round figures, to fl.29,683,500) as also, apart from various reasons to the contrary of a politico-economical nature, in consequence of the circumstance that several assurance institutions have the intention to render their funds available for industrial objects, and especially for the erection of workmen's dwellings in localities where they are required.

Both the fundamental principles of the Austrian law on accident assurance, namely, its *territorial* arrangement, and its *debit-covering* system, for which we have to thank the two authors of the law, Emil Steinbach and Julius Kaan, have been imitated in Norway, and have also been embodied in the Bills on these subjects which have been introduced in Switzerland and the Netherlands.

This Congress is held in London, the metropolis of the British world-wide Empire, of the classical country of self-help. Although different opinions no doubt prevail among the members of the Congress as to the method of application of the principle of workmen's assurance, they are, nevertheless, all agreed that it appertains to the fundamental duties of the modern State to shield, as far as possible, from the vicissitudes of life, those of its citizens who are compelled to earn their bread by their labour.

La question des Accidents du Travail en Italie. Rapport de Gioberti Luzzati, *Directeur de la Société Anonyme Italienne d'Assurances contre les Accidents à Milan.*

La question des accidents du travail, sur laquelle les plus illustres économistes modernes ont beaucoup écrit et beaucoup discuté, a été résolue législativement pour l'Italie le dix-huit du mois de Mars dernier par le vote de la Chambre des Députés, qui accepta sans modifications le projet de loi déjà approuvé par le Sénat du Royaume.

Malgré les amendements proposés et soutenus par d'illustres Députés, compétents en matière; malgré l'opposition du groupe socialiste, plus directement intéressé dans la question; malgré l'absence de toute préoccupation politique, selon les déclarations du Gouvernement; la Chambre, lasse peut-être d'une question que tant de fois elle avait renvoyée et que tant de fois lui était revenue sous des formes nouvelles et inspirée par des vues différentes, retint que le retard d'une résolution, en opposition à une promesse auguste, était pour le pays un dommage plus grande que d'en subir les quelques fautes; et elle coupa court aux délais. Aussi arriva-t-il que la loi sur les accident du travail, examinée en peu de séances alternativement avec d'autres projets de loi par une assemblée peu nombreuse, fut approuvée sans cette sanction morale qui, sur un sujet si important et difficile, aurait pu et dû donner lieu à une discussion plus animée, plus ample et plus profonde.

Le fait étant accompli, il ne reste qu'à s'incliner devant la majesté de la loi. Cependant il n'est peut-être pas inutile de mettre à jour les conditions faites aux ouvriers et aux entrepreneurs de travaux, par les nouveaux droits et les nouvelles obligations, qui viennent d'être sanctionnées, et c'est justement ce que je me propose de faire, soit parce que quelques uns des légers défauts de la loi peuvent encore être corrigés ou tempérés par les règlements relatifs; soit parce qu'il s'agit d'une première expérience législative sur cela, et il se peut très bien que dans son application les défauts moins légers paraissent d'une telle gravité qu'ils imposent plus ou moins promptement la nécessité d'une réforme. Dans un cas ou dans l'autre, la constatation de ces défauts, fait en temps utile et sans préventions, pourra peut-être servir à faciliter la recherche et l'application des modifications nécessaires.

Par la traduction en loi du projet Guicciardini, réformé par le Sénat, bien des arguments autour desquels s'échauffèrent les discussions des économistes et des juristes dans les Parlements et dans les Congrès qui s'occupèrent des *accidents du travail,* peuvent se considérer définitivement résolus pour l'Italie, de sorte qu'il serait académique et pratiquement vain d'en reparler aujourd'hui. Telles sont par exemple les questions relatives au droit de l'État d'imposer aux

industries des règlements particuliers, visant à prévenir les accidents; à la supériorité du système du risque professionel sur le principe de la responsabilité civile; à l'assurance obligatoire des ouvriers; et d'autres moins importantes. Aussi ma tâche est facilitée et abrégée, et elle se borne à mettre en relief certains points de la loi où ces principes sont appliqués confusément et tellement entassés, qu'ils aboutissent en pratique à des conséquences contraires à leur but, ou même nuisible à l'économie publique.

Je suivrai dans mes considérations l'ordre dans lequel les provisions relatives se trouvent disposées dans la loi, que je vais examiner.

Moyens preventifs.

Le droit de l'État d'intervenir par des dispositions dirigées à protéger la vie et la santé des citoyens est reconnu universellement, et il est déjà sanctionné par un si grand nombre de lois particulières, qu'on ne voit d'abord quel fût le besoin d'en raffermir le principe par rapport seulement aux ouvriers des industries contemplées dans la loi; comme si l'État devait négliger ce droit et ce devoir à l'égard des ouvriers employés dans d'autres industries, particulièrement à l'industrie agricole très étendue, dans laquelle l'agglomération des individus, les machines et les autres éléments qui constituent le risque professionel pris pour fondement de la loi actuelle, ne manquent pas, ainsi que les accidents relatifs. Pour comprendre ce besoin il faut remonter à l'histoire des différents projets de loi sur les accidents du travail, qui précédèrent celui qui vient d'être approuvé; en particulier du projet Lacava discuté en 1893, dans lequel les dispositions des moyens préventifs se liaient avec celles relatives à l'assurance et à la responsabilité civile, et où l'on établissait que l'infraction des lois et des règlements préventifs donnait à l'Institut d'assurance le droit de réclamer de l'entrepreneur le remboursement des indemnités payées, et à l'ouvrier celui de recourir contre lui d'après les dispositions ordinaires du Code civil.

Aujourd'hui que la nouvelle loi a quitté cette voie, et a fait surgir, à côté de l'assurance obligatoire, la responsabilité civile du patron il me semble qu'il était superflu de confirmer dans la loi un principe hors de discussion, tel que le droit de l'État d'intervenir dans la prévoyance des accidents partout où s'en présente la nécessité, et qu'il était inutile et absolument pas opportun d'élargir et d'étendre *à priori* l'exercice de ce droit, ainsi que l'on a fait dans quelques unes des dispositions contenues dans les articles 3, 4 et 5 de la même loi.

Puisqu'il s'agit ici de dispositions qui entravent la liberté de l'industriel ou de l'entrepreneur et qui ne peuvent préventivement être déterminées ou limitées; attendu que les matières, les forces, les mécanismes dont l'industrie peut se servir dans ses prodigieuses évolutions sont grandement variés; il me parait que l'action et l'intervention du Gouvernement devaient être autorisées seulement pour les industries dangereuses; c'est-à-dire pour celles dans lesquelles la négligence ou l'ignorance de l'industriel ou de l'entrepreneur dans la règle des fonctions des mécanismes, ou dans la manipulation des matières relatives, puisse causer des accidents, non seulement aux ouvriers directement employés au travail, mais à d'autres personnes aussi. Dans ce sens les dispositions étaient justement bornées dans le

projet Lacava. Il n'y avait aucune raison pour s'en écarter maintenant, puisqu'en rétablissant à côté de l'assurance obligatoire la responsabilité civile, l'intérêt individuel poussait à l'adoption des plus grandes mesures de précaution même le peu d'industriels ou d'entrepreneurs, qui peut-être ne les auraient pas adoptées pour un simple sentiment humanitaire.

En supprimant, ainsi que l'on a fait, le principe de borner le rétablissement de la responsabilité civile du patron au seul cas d'infraction des dispositions et des règlements préventifs, les deux éléments du système—prévision et assurance obligatoire—cessaient d'être un correctif réciproque. Pourtant, s'il n'était pas tout à fait inutile de les réunir dans le même projet, cependant toute raison cessait d'assujettir aux mesures préventives certaines enterprises, qui n'en avaient pas besoin, pour la seule raison que même à celles-ci on voulait étendre l'obligation de l'assurance.

La question, qui préoccupe et alarme le plus les industriels, est le droit que l'article 5 accorde implicitement aux inspecteurs du Gouvernement, chargés de contrôler l'éxécution des dispositions préventives, d'examiner les procédés de travail, du secret desquels depend bien des fois le succés de certaines industries et leurs résultats financiers.

Le réglement qui accompagnera la loi pourra peut-être atténuer cette alarme et cette préoccupation des industriels mieux que l'amende de 500 à 1,000 francs, infligée par la loi aux infracteurs du secret, et que la défense faite aux inspecteurs et aux délégués d'entreprendre pour propre compte ou pour d'autres personnes une industrie quelconque : amende insignifiante par rapport à la valeur matérielle que peut avoir le secret violé; défense insuffisante, ne pouvant pas s'étendre au delà du temps dans lequel il plaise ou il convienne aux inspecteurs et aux délégués de remplir leur place.

De toutes les dispositions sanctionnées à charge de l'industrie, celle de l'inspection est peut-être la plus injuste, parce qu'elle part du soupçon et plus encore d'une certaine présomption de malhonnêteté et de résistance à la loi, contre une classe très respectable de citoyens, tel que les fabricants et les entrepreneurs de travaux : la plus inutile, parce que si le sentiment humanitaire et la crainte de la responsabilité civile, dont on les charge en cas d'accidents, ne suffisaient pas chez les industriels à empêcher les transgressions, certainement cela ne vaudrait pas mieux les amendes infligées par des lois spéciales.

Manières de réparer.

L'accident est une conséquence naturelle de l'industrie; aussi est ce sur l'industrie que doit en retomber le dommage toutes les fois que ce n'est pas la volonté délibérée de l'entrepreneur ou de l'ouvrier qui concourt à créer l'accident, c'est-à-dire quand il n'y a pas de *dol.* Ceci est substantiellement le principe du risque professionnel, l'idée principale sur laquelle la loi a fondé ses dispositions essentielles concernant la réparation des accidents du travail. Il est un principe nouveau, qui n'a pas d'histoire, qui échappe et même en quelques points se heurte aux règles du droit commun en matière de responsabilité; dont on ne sait encore, malgré les efforts de jurisconsultes distingués, à quelles idées, à quelles institutions juridiques on peut le renouer;

bref, il est un de ces principes auxquels il faut de temps en temps faire une place dans le droit, afin de pouvoir accommoder et conformer la législation aux nécessités des temps nouveaux, aux conditions changées des hommes et des nations, et aux principes variables de la politique.

Cela étant, il serait inutile de le discuter du point de vue de l'équité et de la justice inflexible ; il faut donc l'examiner du point de vue de son opportunité et de sa valeur pratique, avant que l'on en étende l'application à d'autres lois d'ordre social, en cours d'étude pour assurer aux ouvriers les pensions de retraite, les indemnités en cas de maladie, les salaires en cas de grèves involontaires, etc.

La première question qui se présente est celle de connaitre l'importance de la charge financière dont est frappée l'industrie nationale par la nouvelle loi. Il est absolument impossible, à l'état actuel des choses, d'évaluer cette charge avec assez de précision et de sûreté, ou, en d'autres termes, de déterminer la prime moyenne nécessaire pour couvrir le risque d'accident du travail dans les conditions prescrites par la loi, et pour toutes les classes sujettes, d'après elle, à l'obligation de l'assurance.

Le manque d'une bonne statistique professionnelle italienne ne permet pas de préciser le premier des éléments nécessaires pour un pareil calcul, c'est-à-dire le nombre des ouvriers divisés par sexe et par profession à qui on a concédé le bénéfice de l'assurance obligatoire, et la moyenne de leur salaire journalier. Les statistiques de la Caisse Nationale d'assurance pour les accidents du travail, les seules qui existent en Italie à l'égard des coéfficients d'accidents de nos industries, outre qu'elles ne distinguent pas les ouvriers par sexe et par profession, comprennent une période de temps trop courte et un champ d'observation trop restreint pour qu'on puisse en déduire des quotients sérieux de probabilités par rapport aux conséquences diverses causées par les accidents et aux diverses indemnités qui en suivent. Il faut pourtant procéder à ce calcul empiriquement et compléter le peu de données des statistiques italiennes en y ajoutant celles plus récentes, plus étendues et plus exactes qui sont fournies par les statistiques étrangères et particulièrement allemandes. En effet c'est ainsi que durent procéder tous ceux qui eurent à s'occuper de cette évaluation pour référer ou discuter sur les différents projets de loi sur les accidents du travail, présentés à la Chambre. C'est ce que je ferai en prenant pour base les données statistiques alleguées au savant rapport que le regretté Auriti présenta au Sénat du Royaume en Fevrier 1892, à l'appui des modifications proposées au projet de loi du ministre Chimirri ; et je les complèterai et les ajusterai de mon mieux aux dispositions de la nouvelle loi.

M. le Sénateur Auriti avait calculé à 1.066.000 le nombre des ouvriers qui auraient dû être assurés, d'après ce projet-là. Cependant, à cause des nouvelles industries auxquelles la loi actuelle étendit l'obligation de l'assurance (sociétés pour la production du gaz—sociétés de force électrique—entreprises téléphoniques); à cause du grande développement vérifié pendant les quinze dernières années après le dernier recensement de 1881 dans quelques-unes des industries déjà comprises dans ce projet-là (arsenaux, chantiers maritimes, chemins de fer, tramways); à cause du plus grand usage qu'on fait à présent de moteurs mécaniques; à cause enfin de la réduction de 10 a 5 du nombre d'ouvriers travaillants dans la même établissement, au delà

duquel l'assurance est maintenant obligatoire pour les industries indiquées sous les numéros 2 et 3 de l'article 1, on peut présumer que le nombre des ouvriers, à qui le bénéfice de l'assurance devra s'éntendre d'après la loi actuelle, ne sera pas moindre de 1.7000.000, dont deux tiers environ seraient hommes et un tiers femmes, en acceptant la proportion entre les deux sexes, évaluée par M. Auriti.

La moyenne du salaire journalier de l'ouvrier—second élément essentiel du calcul en question—fut par M. Auriti constatée de L. 2 pour les hommes et L. 1.50 pour les femmes.

En suivant les vicissitudes et l'évolution des principales industries italiennes dans le courant des dernières années, en peut présumer que la moyenne des salaires des ouvriers a augmentée; cependant puisque les données pour préciser le prix actuel de la main d'œuvre manquent, il faut bien accepter pour ce calcul sommaire, les moyennes susindiquées.

En supposant que les jours de travail dans une année soient 300, la moyenne annuelle du salaire sera de L. 600 pour les ouvriers et de L. 450 pour les ouvrières; ce qui, appliqué à la masse des ouvriers contemplés dans la loi actuelle (savoir 1.700.000 ouvriers, dont $\frac{2}{3}$ hommes et $\frac{1}{3}$ femmes) donne un salaire moyen complexe de L. 550 par an et de L. 1.80 par jour, et fait monter la somme totale des salaires payés annuellement aux sus-dits ouvriers au chiffre rond de L. 935.000.000.

Encore plus difficiles et incertaines sont les recherches par rapport au troisème et plus important élément du calcul, c'est-à-dire le coéfficient d'accidents; pour le déterminer il faudrait connaître la quantité moyenne des accidents du travail qui s'en vérifient par an et les différentes conséquences physiques qui s'en suivent en rapport avec la gradation des indemnités respectivement assignées par la loi.

M. Auriti, en prenant pour base les accidents enregistrés dans la statistique allemande de trois années 1886-87-88 et dans l'italienne des années 1888-89-90-91, évalua que la charge financière des industriels italiens pour le chiffre déjà fixé de 1.066.000 ouvriers, assurés d'après son projet, aurait été de L. 6.117.677 selon la première des deux statistiques et de L. 5.268.582 selon la seconde, si l'on devait payer l'indemnité en cas d'invalidité temporaire, depuis le premier jour pour toutes les maladies, même pour celles de courte durée. En appliquant cette évaluation au chiffre de 1.700.000 ouvriers, auxquels la nouvelle loi étend l'assurance obligatoire, on aurait dans les mêmes conditions une charge de L. 9.756.145 d'après la statistique allemande et de L. 8.401.974 d'après la statisque italienne.

Il faut ici remarquer que M. Auriti observait déjà que le calcul fait sur l'expérience allemande était plus sûr, puisqu'il avait pour base un nombre de têtes-années 36 fois plus grand que celui noté dans la statistique italienne de la Caisse Nationale contre les accidents; en adoptant les coéfficients d'accidents sus-exposés, il en déduisait que la charge financière annuelle pour l'assurance obligatoire dans les limites et aux conditions établies par le projet de loi, dont il était rapporteur, était égal à 1 °/₀ du montant des salaires.

Sans refaire le calcul de M. Auriti sur la base des statistiques les plus récentes et des dispositions particulières de la nouvelle loi, on peut affirmer avec sûreté que d'après elles la charge financière pour l'assurance obligatoire doit être considérablement augmentée. Il y a

beaucoup de raison à cela. D'abord il est prouvé que le nombre des accidents croit en général dans les pays où l'assurance des ouvriers est obligatoire; en Allemagne, depuis le 1886 jusqu'au 1896, ils montèrent de 10.500 à 86.500; les statistiques de la Caisse Nationale marquent aussi une augmentation, particulièrement dans les accidents légers pour lesquels on a disposé un secours journalier. Il n'est pas utile d'insister pour prouver que si le nombre des accidents augmente, la charge de l'obligation de l'assurance augmente aussi.

Secondement le coéfficient d'accidents sur lequel M. Auriti basait ses calculs vient d'être augmenté par les différences introduites dans la nouvelle loi, par rapport au projet Chimirri modifié, à l'égard de la mesure des indemnités assignées aux victimes des accidents. En effet, tandis que pour le cas d'invalidité permanente absolue, ce projet-là établissait purement et simplement une indemnité égale à cinq fois le salaire annuel, la nouvelle loi y ajoute un minimum de L. 3000; ce qui implique une augmentation de charge, particulièrement pour les accidents des femmes.

Le salaire moyen des ouvrières étant évalué, ainsi qu'on a déja vu à L. 450) annuelles, il en résulte que l'ouvrière qui, pour ce cas d'accident, aurait eu le droit à une indemnité de L. 2250, touchera, au contraire, d'après la nouvelle loi une indemnité de L. 3000.

Dans le cas d'invalidité temporaire absolue l'indemnité journalière d'après le projet Ministeriel de 1891 modifié par le Sénat, courait depuis le onzième jour de maladie jusqu'a la dernière limite de 360 jours: la nouvelle loi, au contraire, la fait courir depuis le sixième jour de maladie, et la prolonge tant qu'elle dure, sans aucune limite.

La différence de la charge financière par suite de cette inégalité de conditions est très grande: il est pourtant juste de remarquer que dans le calcul sommaire que je viens de faire d'après les idées de M. Auriti, j'en ai tenu compte puisque j'ai pris comme terme de comparaison la charge probable évaluée par lui de L. 6.117.670 selon la statistique allemande et de L. 5.268.582 selon la statistique italienne: charge qui précisement se rapportait au cas dans lequel le secours de maladie doit être donné pour toutes les maladies à dater du premier jour d'infirmité. En tenant compte de cela on devrait réduire plus encore la charge que j'ai exposée, en considération des cinq jours de délai concédés par la loi actuelle: mais puisque le bénéfice du délai est réduit à si peu de jours qu'il doit être très exigu et qu'on peut présumer qu'il est paralysé dan ses effets par le dommage, que la concomitante suppression de la limite des 360 jours auparavant fixée pour la plus longue durée du secours pourra lui apporter, il me paraît inutile de procéder à une correction qui pourrait altérer les résultats généraux du calcul.

Enfin, en cas de mort la nouvelle loi a nouvellement porté l'indemnité à la somme de 5 salaires annuels, tandis que le projet auquel les calculs de M. Auriti se réferaient, l'assignait seulement jusqu'a 4 salaires annuels; d'où il résulte encore une charge plus grande que celle alors évaluée.

A tous ces éléments qui concourent à élever le pourcentage du rapport entre la charge financière, qui en résulte pour l'industrie, par l'assurance obligatoire, et le montant des salaires, évalué par M. Chimirri à 1 pour cent, on doit ajouter un autre élément très influent, dont M. l'ex-Ministre ne tint pas compte. Je veux parler de l'élément des

frais inhérents à l'impôt sur l'assurance qui iront toujours tomber sur l'industrie, qu'ils soient chargés par les instituts d'assurance sur la prime, ou soutenus directement par les industriels assurés. On peut se faire une idée de la gravité de ces frais, en examinant les effets que l'assurance obligatoire a eu à ce sujet en Allemagne. Depuis 1886 jusqu'au 1892 les frais chargés sur les patrons de 464 pour 100 unités de salaire étaient montés à 12 pour 100, et en 1895 sur M. 50.000.000 d'indemnités payées en total pour les accident, on dépensait M. 10.000.000 seulement pour les salaires des 30.000 employés fonctionnant pour le service d'assurance. Même les frais de justice pour contestation entre patrons et ouvriers ont augmenté en Allemagne après l'application de l'assurance obligatoire, et, en 1892, ils montaient à M. 1.034.929 tandis qu'en 1886 ils étaient seulement de M. 207.214; c'est à dire qu'ils étaient cinq fois plus grands. Même en espérant que la capitalisation de l'indemnité adoptée par la loi italienne supprime les causes principales de l'augmentation continuelle des frais et des contestations verifiée en Allemagne, on doit toujours admettre que les dispositions de la nouvelle loi causeront à l'industrie, indépendamment de la charge de l'indemnité, beaucoup de frais.

Pourtant en ajoutant les effets que l'on pourrait prévoir de tous ces nouveaux éléments de charge qui se sont adjoints a ceux déjà évalués par M. Chimirri, on peut déduire que l'appréciation exprimée dans la discussion au Sénat par M. Vitelleschi, contraire au projet, n'était pas exagérée, dans son évaluation que la charge annuelle pour l'industrie serait de 10 à 12 millions.

Quelle qu'en soit la raison et de quelle manière qu'on veuille la nommer, cette somme représente un nouveau et fort impôt sur l'industrie italienne, qui, dans les conditions où elle se trouve, ne peut le supporter sans dommages ou dangers; et elle devra pourtant nécessairement le faire retomber en partie sur la main d'œuvre et sur la consommation, à la charge donc de la même classe qu'on a voulu favoriser avec la nouvelle loi.

La question de la forme de l'indemnité, dans la nouvelle loi, ainsi que dans le plupart des projets qui la précédèrent, fut résolue dans un sens contraire aux méthodes préférées dans les lois étrangères du même genre, et même dans la loi allemande, qu'on a prise comme exemple pour les lignes générales de la loi italienne.

Cette solution a été presque imposée par le défaut en Italie d'une Caisse de Retraite pour les ouvriers et d'associations mutuelles organisées entre les industriels dans le même but. Elle presente trois avantages:

1° de simplifier la détermination des primes d'assurance, qui, pour le défaut de tables de mortalité particulières parmi les employés des diverses industries, aurait été très difficile et pas sûre, si l'on avait appliqué le système de la pension viagère transmissible aux héritiers;

2° de rendre moins graves les suites d'une faillite éventuelle de l'institut d'assurance, en les bornant aux ouvriers frappés par un accident dans la période de la faillite;

3° d'ôter probablement une des causes pour lesquelles les frais et les contestations augmentèrent démesurément en Allemagne, après l'application de l'assurance obligatoire.

L'esprit de tutelle auquel la loi s'est inspirée donne l'explication de la cause pour laquelle dans l'article 13 de la même loi on a fait exception à ce système, en établissant que, dans les cas d'invalidité permanente absolue, l'indemnité liquidée doit ordinairement se convertir en rente viagère chez la Caisse Nationale de prévoyance pour la vieillesse et l'invalidité des ouvriers qui doit être instituée, et en attendant cette institution, chez une des Sociétés privées d'assurance sur la vie légalement constituées dans le Royaume, et indiquée par l'ouvrier frappé d'accident.

Contre les avantages que je viens de faire remarquer, la capitalisation de l'indemnité présente un côté désavantageux, dont les effets financiers ne peuvent pas être évalués *à priori ;* et il consiste en ceci, que, lorsque le paiement de l'indemnité a été effectué, le contrôle sur les vraies suites de l'accident, cesse après la classification de celui-ci ; et le dommage qui en résulte en pratique pour l'industrie en cas de dol est sans remède ; de là une plus grande facilité, et même un encouragement aux fraudes.

Presque tous législateurs étrangers, en matière d'accident du travail, accueillirent le voeu formulé par le Congrès International de Berne en 1891, savoir qu'on exclût du bénéfice de l'assurance les accidents légers et qui causent invalidité pour peu de temps, pour les renouer aux provisions qui ont rapport aux maladies en général.— Puisqu'il n'y a pas en Italie une loi, ni d'institution publiques qui pourvoient aux maladies, on n'a pas voulu sanctionner une exclusion qui semblait rendre vain le but social de la loi actuelle sur les accidents, et on en vint ainsi à charger la prime d'assurance même pour cette part du risque d'accident éventuel qui dans les autres pays vient généralement tomber sur les Caisses-Maladies.—On n'a pas tenu compte des nombreuses sociétés de secours mutuel qui existent en Italie, qui ont précisément le but d'indemniser les associés en cas de maladie, et qui auraient trouvé dans l'exclusion des légers accidents du bénéfice de l'assurance, un nouvel aliment et une nouvelle force d'expansion avec l'avantage moral de la classe des ouvriers, qui par un léger sacrifice, pourvoyait d'elle même aux plus légères suites du risque du travail, et soulageait en même temps l'industrie à qui restait la charge des plus graves et plus sérieux accidents.—Au lieu des limites de 15 à 10 jours de delai admises dans les projets précédents, on a sanctionné dans la loi approuvée, la limite de 5 jours seulement, limite minime et qui ne constitue aucun sensible bénéfice pour l'industrie ; en effet, on doit songer qu'aux premiers soins, à la première assistance pourvoient toujours les patrons par habitude et par un sentiment humanitaire, et que, d'un autre côté, c'est justement dans les accidents légers que les fraudes sont plus fréquentes, et plus faciles les simulations pour ce qui regarde la durée de la maladie.—On a déjà vu plus haut quel est l'effet financier de cette provision de l'actuelle loi, en cherchant le montant présumable de la charge annuelle résultant pour l'industrie d'après cette loi, et il est tout à fait inutile d'en reparler.

Et me voilà maintenant à la plus grave des questions qui se lient à notre thème, à celle qui excita les plus vives et les plus longues discussions au sein des Congrès, sur laquelle les discussions au lieu de s'apaiser s'échauffèrent en Italie encore davantage, après la solution donnée par les articles 22 et 23 de la loi actuelle: c'est è dire à la question que les techniciens appellent de la *faute lourde.*—D'après

la genèse de la théorie du risque professionel, il paraissait que son champ d'action devait se restreindre à ces accidents qui, causés par une force majeure, par fatalité, ou par des causes indéterminées, pouvaient être considérés comme des suites simplement aléatoires du travail.— Une loi qui eût borné entre ces limites l'application de cette nouvelle théorie n'aurait pas manqué d'être avantageuse, puisqu'elle aurait réparé (selon les résultats des statistiques actuelles) presque une moitié des accidents généraux du travail; et précisément cette moitié qui ne trouvait pas dans le droit commun le moyen d'être indemnisée.— Cependant une telle loi n'aurait satisfait ni les ouvriers, ni les patrons, parce que pour l'autre moitié des accidents causés par des fautes plus au moins lourdes, l'indemnité n'aurait pu être en cas normal ni determinée, ni concédée, si non par suite d'un jugement établissant les responsabilités.

Mais ces jugements présentent au point de vue juridique de grandes difficultés pour prouver la faute et pour déterminer sa gravité; au point de vue social ils ont la très grande faute de maintenir en antagonisme perpétuel les intérêts des ouvriers avec ceux des entrepreneurs; et au point de vue économique celui de causer aux ouvriers et à leurs familles de longs et nuisibles retards dans le paiement de l'indemnité, si la faute est du patron, et beaucoup de frais aux patrons si la faute est de l'ouvrier.

Pour réparer à ces inconvénients et maintenir à la loi sur les accidents du travail son but politique, c'est-à-dire de réconcilier le travail avec le capital, il fallait nécessairement s'écarter des règles du droit commun en matière de responsabilité civile; ainsi arriva-t-il que de la tentative de renverser la preuve, on en vint, après le passage dans les différents projets, à étendre le principe du risque professionel même aux accidents dûs à une faute, en les admettant tous, au bénéfice de l'assurance, hors le cas de dol. L'ouvrier, victime d'un accident dû à sa négligence, à sa désobéissance aux règlements de l'établissement ou de la loi, à des causes dépendantes de sa volonté, acquerrait ainsi le droit à l'indemnité à la charge du patron, qui a l'obligation de payer la prime d'assurance. Cette provision peut être expliquée par le sentiment d'humanité et de pitié qui naît de la pensée des suites douloureuses que l'accident cause au coupable et à son innocente famille; mais au point vue du droit, de la logique et de l'equité il n'y a et il n'y aura jamais de sophysme juridique qui vaille à la justifier. Les adversaires de ce principe n'ont pas manqué de remarquer qu'en supprimant la responsabilité de l'ouvrier, on l'offensait dans sa qualité d'homme, qu'on supprimait avec elle un grand moteur de la vie, un élément puissant de progrès; qu'on rendait inutile et injuste la charge des mesures préventives imposées au patron contre les accidents. — Ces objections et d'autres encore ne servirent à rien; on a fait prévaloir l'exemple donné par l'Allemagne et l'idée de l'opportunité pour le but politique de la loi, par laquelle ou sanctionna l'irresponsabilité absolue de l'ouvrier pour les causes de l'accident, excepté le seul cas de dol, prouvé au moyen d'un arrêt pénal.

Cette exception aux règles communes de la responsabilité civile établie en faveur de l'ouvrier aboutissait à une plus grande charge financière pour le patron obligé à l'assurer; et il semblait juste d'accorder à ce dernier une compensation en l'exonerant à son tour de toute responsabilité civile envers l'ouvrier pour la dommage corres-

pondant à l'accident, qui lui avait été déjà réparé au moyen de l'assurance obligatoire. Mais quand il s'agit de venir en aide de l'industriel, ni l'exemple contraire de l'Allemagne, ni le but de la conciliation sociale qu'on voulait atteindre par la loi, ne s'imposèrent au législateur, qui, dans les Articles 22 et 23, déjà cités, à côté de l'assurance obligatoire inscrivait à la charge du patron la responsabilité civile d'après les règles du droit commun en l'exonérant seulement lorsque la condamnation de la faute "*eût lieu pour un crime, pour lequel l'action pénale ne pût s'exercer sans demande de poursuite,*" ou, en d'autres termes équivalents, lorsque la maladie causée par l'accident n'allait pas au délà de dix jours.

Les partisans de la nouvelle loi s'efforcèrent de la justifier par plusieurs raisons qui ne seraient certainement pas arrivées à convaincre la Chambre des Députés, si celle-ci, pour les raisons dont j'ai déjà parlé au commencement de ce rapport, n'avait été plus pressée d'en finir avec elle, que d'en examiner et perfectionner les articles. Entre autres choses ils firent cette remarque: que, si en Allemagne la question de la faute lourde avait été resolue dans le sens d'en soulager le patron autant que l'ouvrier, cela avait été possible parce qu'il existait dans ce pays-là un système complet de lois sociales pour la tutelle de l'ouvrier, ce qui manque encore en Italie; et qu'il y a là une série de règlements très détaillés dont l'exécution est garantie par des inspections rigoureuses et des peines sévères. Mais ils ne songeaient pas que de cette manière ils infirmaient toutes les autres principales dispositions de la nouvelle loi empruntée à la loi allemande, et qu'ils décriaient les mesures préventives insérées dans la loi. Ils dirent aussi que le principe de la responsabilité civile à la charge du patron était sanctionné dans une loi très récente approuvée en Angleterre, lorsque l'accident était causé par sa négligence; mais par contre cette loi-là sanctionnait la déchéance de l'ouvrier du droit de secours lorsque l'accident était causé par mauvaise conduite délibérée et continuelle. Or, par cette phrase, selon les vues de la loi et de la jurisprudence anglaises, on arrive à exclure le droit de l'indemnité dans une des causes les plus fréquentes et générales des accidents causés par la faute de l'ouvrier, c'est-à-dire l'ivresse.

On a dit aussi que la statistique a prouvé que le nombre des accidents causés par une faute grave du patron est si petit (de 5 à 6 pour-cent) que la charge financière qui en serait résultée pour l'industrie par la conservation de la responsabilité civile dans ces cas, devait être très légère. Et ils ajoutèrent aussi que le patron aurait pu se dédommager de cette responsabilité civile par des assurances spéciales chez des sociétés privées qui demandent pour cela des primes minimes. Mais cette remarque, qui n'enlève point l'injustice de la loi envers la classe des entrepreneurs, est une condamnation de la défiance que le législateur a montré envers cette classe, en réglant les mesures préventives des accidents.

D'ailleurs ce qui affecte l'industrie, pour ce qui a rapport aux effets financiers à sa charge d'après la conservation de la responsabilité civile dans le seul cas de la faute du patron ce n'est pas tant la pensée des indemnités auxquelles pour cela elle devra se soumettre, et celle de la prime d'assurance dont elle devra se charger pour s'en délivrer, que la pensée des nombreuses contestations, auxquelles cette provision laisse la porte ouverte, et auxquelles l'ouvrier aura recours

bien plus facilement qu'auparavant, puisqu'à present il trouvera dans les indemnities perçues au moyen de l'assurance un plus grand encouragement à initier le procès pénal contre son maître et plus de moyens pour se constituer partie civile dans ce procès afin d'obtenir une seconde indemnité pour le même accident. Il est vrai qu'on peut présumer qu'après l'assurance obligatoire et l'indemnité qui s'en suit pour l'ouvrier victime d'un accident, quelle qu'en soit la cause pourvu qu'il n'y ait pas dol, il viendra diminuer chez les magistrats ce sentiment de pitié qui jusqu'ici les poussait à rejeter sur l'industriel la faute de chaque accident comme le seul moyen de pouvoir secourir la victime d'après le Code; de même on peut présumer pour ce penchant qui presque malgré eux portait les magistrats à être plus sévères en déterminant le mesure de la responsabilité civile, lorsqu'il leur fallait la reconnaître à la charge du patron. Mais quelque rationnel qu'il soit, il s'agit ici d'un simple espoir qui peut ou non se réaliser, et dans la meilleure des hypothèses il réussira à diminuer mais non à empêcher l'augmentation des contestations qu'on a raison de craindre. En conséquence le but principal de la loi dont nous parlons, est manqué, puisque, ainsi que j'ai déjà dit, il devrait être de concilier les intérêts de deux classes en lutte, et de rendre plus amiables les rapports entre patrons et ouvriers.

Sur la manière de couvrir l'assurance le Sénat écarta avec beaucoup d'opportunité le monopole soutenu dans son projet par l'ex-ministre Guicciardini en faveur de la Caisse Nationale d'assurance pour les accidents du travail, créé par la loi 8 juillet 1893; aussi l'industriel est-il libre de se servir de cette caisse, ou des Syndicats qui pourront au besoin se constituer parmi les mêmes industriels, ou d'une des institutions d'assurance légalement autorisées à fonctionner dans le Royaume. L'obligation de l'assurance à la Caisse Nationale fut conservée par la loi pour les seuls travaux exécutés pour compte de l'Etat, des Provinces et des Communes. Un règlement, qu'on ne connaît pas encore, déterminera les règles et les cautions auxquelles les Compagnies privées et les Syndicats devront se soumettre pour exercer l'assurance des accidents du travail.

La liberté du choix de l'institut d'assurance répond aux principes libéraux dominants dans le droit italien an matière de concurrence : de plus, il a l'avantage de respecter toutes les organisations qui existent déjà, et celles qui pourront s'établir comme association entre les industries qui présentent les mêmes degrés de risque.

La Caisse Nationale, instituée à Milan en 1883–1884 avec le concours des dix meilleures caisses d'épargnes du Royaume qui lui constituèrent un fond de garantie de L. 1.500.000, compte déjà plus de 170.000 ouvriers assurés. N'ayant pas un but spéculatif, ni de grands frais d'administration, elle peut pratiquer l'assurance à des primes bien modérées, et elle a ainsi l'avantage d'empêcher les compagnies privées de s'accorder pour imposer au public des tarifs élevés plutôt que de concurrence. Pour les garanties matérielles la Caisse Nationale ne se trouve pas en meilleures conditions que les principales Compagnies privées d'assurance contre les accidents qui lui font concurrence, autant pour l'importance des capitaux que pour la solidité, puisque le million et demi de fonds de garantie devrait être remboursé, à la rigueur de droit, aux Instituts fondateurs sur les profits annuels de ses exercices. Personne ne peut méconnaitre le bienfait que l'institution de la

Caisse Nationale a rendu au pays, et celui bien plus grand qu'elle lui pourra apporter lorsque la loi sur les accidents du travail entrera en vigueur. Cependant il serait injuste d'oublier qu'à côté de la Caisse Nationale les enterprises privées d'assurance ont certainement bien mérité du pays en assurant, toutes ensemble, un nombre d'ouvriers peu inférieur au sien (c'est-à-dire 130,000), et pourvoyant à la liquidation et au paiement des indemnités avec toute exatitude.

Les Syndicats autorisés par la loi pourront se constituer et fonctionner parmi les plus riches et les moins dangereuses des industries, et seront eux-aussi très utiles à condition pourtant qu'on établisse dans le règlement à leur égard des dispositions et des cautions efficaces et suffisantes pour garantir leur sûreté et celles de leurs opérations, et pour empêcher qu'ils donnent lieu à ces inconvénients que tant de fois on a déploré à propos des petites sociétés mutuelles et co-operatives pour d'autres branches d'assurance.

Les défauts principaux de la loi, que j'ai remarqués, avaient été déjà montrés et combattus par d'illustres juristes et économistes dans les Congrès et dans la discussion, chez les assemblées législatives nationales et étrangères, des nombreux projets qui précédèrent la nouvelle loi italienne sur les accidents du travail, qu'on vient d'approuver. Malgré cela et malgré le pressentiment avoué même par les promoteurs et les partisans de la loi de faire une œuvre imparfaite et défectueuse, la Chambre italienne, devançant l'expérience d'autre pays et la maturité des études sur cette matière, a voulou la sanctionner pour les raisons que j'ai indiquées au commencement de ce rapport.

Par ce qui précède je ne veux certainement pas affirmer que la loi ainsi qu'elle a été faite, n'apportera aucuns bienfaits, et ce ne sera pas le dernier et le moindre celui de pousser les instituts d'assurance et les syndicats industriels à étudier et appliquer tous les moyens possibles pour atténuer les conséquences des accidents. L'institution d'ambulances speciales pour les soins des lésions traumatiques, dont Milan donna un noble exemple, s'étendra peut être dans tous les plus grands centres du pays et trouvera dans la philanthropie des populations un appui moral et matériel. Ainsi par la prompte application du remède en donnera à l'ouvrier et à l'industrie l'avantage d'empêcher la surcharge des suites de l'accident, et d'abréger le temps d'inhabileté au travail.

Maintenant qui j'ai épuisée la tâche que je m'etais proposée, il ne me reste qu'à expliquer pourquoi j'ai voulu dédier au 2.e Congrès des actuaires ma monographie. Parmi les questions proposées par le Comité organisateur de ce Congrès il y a celle de "*la législation en matière d'assurance sur la vie*" avec laquelle la thèse que je viens de développer peut avoir quelques points de contact; et l'autre de la "*réparation des accidents du travail*", avec laquelle plus directement et plus intimement elle se lie.—Le Conseil de Direction de l'*Association italienne pour le développement de la science des actuaires*, récemment créé à Milan, recommendait à ses sociétaires de concourir à l'œuvre du Congrès, et conseillait, entre autre, pour le théme sur les accidents de référer aux études et aux projets de loi, concernant l'assurance obligatoire l'invalidité.—J'ai cru qu'une critique objective, impartiale des principales dispositions sanctionnées dans la loi italienne qu'on vient d'approuver, n'allât pas au delà de ce que le Congrès avait proposé, ni de ce qu'avait recommandé le Conseil de Direction de

l'Association Italienne des actuaires à laquelle j'ai l'honneur d'appartenir.—La mission des actuaires, en rapport avec la question de l'assurance des accidents du travail, est sans doute très importante; mais elle n'a pas encore pu s'expliquer par suite précisément des graves oppositions qui se manifestèrent dans les Congrès et dans les Assemblées législatives sur l'obligation ou sur la liberté de l'assurance, aux limites de son application, à la mesure et à la forme des indemnités en faveur des victimes et de leurs familles et à d'autres éléments fondamentaux pour la classification et les tarifs des divers risques.

À cette nécessité les entreprises privées d'assurance et les syndicats ne peuvent pourvoir que provisoirement et impiriquement: c'est aux actuaires à réunir et à classer les données statistiques nécessaires et à procéder d'après ces données à l'évaluation scientifique du risque et de la prime relative, en faisant, pour l'assurance des accidents cet admirable travail qu'ils firent déjà dans le même but pour l'assurance sur la vie. Pour l'Italie le système de la capitalization de l'indemnité adopté par la nouvelle loi a beaucoup simplifié cette tâche en ôtant une foule de circonstances dont il aurait fallu tenir compte dans le calcul des probabilités si l'on avait suivi la méthode allemande pour les pensions. Toutefois pour le cas d'invalidité permanente absolue la difficulté se renouvelle en force de l'article 13; et il faut la résoudre au plus vite, autant dans l'intérêt des sociétés privées d'assurance que dans celui de la Caisse Nationale de prévoyance pour la vieillesse et pour l'invalidité des ouvriers, qui va s'instituer, parce qu'elles sont appelées à constituer des pensions viagères sur la base d'éléments nouveaux qui ne se retrouvent ni dans les statistiques générales de la population, ni dans les tables ordinaires de survie.

Cependant j'ai tort de continuer á expliquer la tâche des actuaires vis-à-vis de la nouvelle et particulière branche des assurances contre les accidents du travail, tandis que je sais qu'ils se disposent déjà à l'affronter aver cette passion, ce zèle et cette constance qui sont les qualités caractéristiques de ceux qui cultivent et dirigent une science positive des plus difficiles et plus sévères dans le but noble et philanthropique de l'amélioration sociale. Beaucoup des questions, qui maintenant divisent législateurs et économistes quant aux moyens, à la mesure, et aux limites des indemnités qu'on peut accorder à ceux qui sont frappés d'accident sur le travail sans blesser dans le capital la première source du travail lui-même, ne pourront définitivement se résoudre avant que les actuaires en aient examiné et montré mathématiquement les conséquences financières. Pour arriver à cela il faut qu'ils se fassent une idée claire et complète de ces questions, et c'est certes dans ce but que dans l'ordre du jour du Congrès International de Londres on a donné une place distinguée au thême des accidents du travail. J'ai pensé de montrer les points de ce thême sur lesquels les discussions et les incertitudes sont encore vives en Italie, malgré la solution que la loi qui entrera bientôt en vigueur leur a donnée. Si cela pourra en quelque manière directement ou indirectement servir au but que le Congrès se propose, je serai satisfait de ne pas avoir fait, par cette pauvre monographie, un travail tout à fait inutile. En tout cas mes honorables collègues du Congrés auront la bontè de m'excuser, eu égard aux bonnes intentions qui me poussèrent à l'écrire et à la leur dédier.

Translation.

The question of Workmen's Accidents in Italy. *By* Gioberti Luzzati, *Manager of the Italian Accident Assurance Company of Milan.*

The question of labour accidents, regarding which the most eminent modern economists have written and debated much, was legislatively solved for Italy on the 18th of March last, by the vote of the Chamber of Deputies, which accepted without modification the Bill already approved by the Senate of the Kingdom.

Notwithstanding the amendments proposed and supported by eminent Deputies, well versed in the matter; notwithstanding the opposition of the socialist group more directly interested in the question; notwithstanding the absence of all political trouble, as declared by the Government; the Chamber, tired probably of a question which it had so many times deferred, and which so many times had come back to it under new forms and inspired by different views, felt that to delay a decision, in opposition to an august promise, would be for the country a greater evil than to submit to its few shortcomings; and it put an end to all delays. It thus happened that the law on labour accidents, considered during but few sittings, alternately with other Bills, by an Assembly with only a small attendance, was approved without that moral sanction which, on so important and difficult a subject, might and should have given rise to a more animated, full, and thorough discussion.

The fact being accomplished, there remains but to bow before the majesty of the law. Nevertheless, it may perhaps not be useless to throw some light upon the conditions imposed upon the workmen, and on the contractors of works, by the new rights and the new obligations which have just been sanctioned, and this is exactly what I propose to do, because some of the slight defects of the law may still be rectified or minimised by suitable regulations; and because a first legislative effort is in question; and it may thus very well happen that in its application the more serious deficiencies may appear to be of such gravity as to render a reform more or less promptly necessary. In either case, the recognition of these defects at the proper time, and without prejudice may perhaps serve to facilitate the discovery and the application of the necessary amendments.

By the passing into law of the Bill of Guicciardini, amended by the Senate, many controversies, arousing heated discussions by

economists and lawyers in Parliaments and Congresses, regarding labour accidents, may now be considered as finally disposed of so far as Italy is concerned; and it would therefore be academical and practically useless to refer to them again now. Such are, for instance, the questions relating to the right of the State to subject industries to special regulations, having for object to prevent accidents; to the superiority of the system of the trade liability over the principle of civic responsibility; to the obligatory assurance of the workmen; and others less important. My task is, therefore, rendered easier and curtailed, and is confined to bring out certain points of the law where these principles are applied confusedly, and are so involved as to lead, in practice, to consequences quite the reverse of their aim, or even prejudicial to public welfare.

In my remarks I shall follow the order in which the respective provisions are dealt with in the law I am about to discuss.

Preventive Measures.

The right of the State to intervene, by provisions directed to the protection of the life and health of the citizens, is universally recognized, and already sanctioned by so great a number of special laws, that it is not easy to see what need there was to re-affirm the principle in connection solely with the workmen engaged in the trades dealt with by the law; just as if the State should neglect this right and this duty with regard to workmen engaged in other industries, particularly in the very extensive agricultural industry, from which the agglomeration of individuals, the machinery and other elements constituting the trade risk which forms the basis of the present law, are not absent, as well as the corresponding accidents. To understand this need, it is necessary to go back to the history of the different Bills on labour accidents which preceded the one just passed, particularly to the Bill of Lacava, discussed in 1893, in which the regulations regarding preventive measures were bound up with those relating to assurance and civil responsibilily; and where it was laid down that the infringement of the laws and of the preventive regulations gave to the assurance company the right to claim from the employer the refund of the compensation paid; and to the workman the right to have recourse against him pursuant to the ordinary provisions of the civil code.

Now that the new law has left this path and has given rise, alongside of obligatory assurance, to the civil responsibility of the employer, it seems to me that it was superfluous to confirm, in the law, a principle beyond discussion, such as the right of the State to intervene for the purpose of preventing accidents wheresoever the necessity should arise; and that it was useless, and not at all opportune, to widen and extend *à priori* the application of this right, as has been done in some of the provisions contained in Articles 3, 4, and 5 of the said law.

As the question here relates to provisions infringing on the liberty of the manufacturer or of the contractor, and which cannot, in advance, be specified or limited; and seeing that the materials, motive powers and machinery, of which industry may make use in its wonderful developments, vary greatly; it seems to me that the action and intervention of the Government should be authorized only as

regards hazardous trades, *i.e.*, as regards those in which the negligence or ignorance of the manufacturer or contractor in the use of the machinery, or in the handling of the materials, may cause accidents, not only to the workmen directly engaged, but to other persons as well. In this direction, the provisions were rightly limited in the Bill of Lacava. There was no reason to depart from them now, seeing that by re-instating, in addition to obligatory assurance, the civil responsibility, individual interest urged the adoption of the greatest measures of precaution by even the few manufacturers or contractors who might not have adopted them for ordinary humanitarian considerations.

In abolishing, as has been done, the principle of confining the re-enactment of the civil responsibility of the employer, to the case solely of infringement of the preventive provisions and regulations, the two elements of the system—foresight and obligatory assurance—ceased to be reciprocally corrective. Yet, if it was not altogether useless to combine them in the same Bill, there was no cause to subject to the preventive measures certain trades which were not in need of them, merely for the reason that, to these even, it was desired to extend obligatory assurance.

The question which troubles and alarms, most of all, the manufacturers, is the right which Article 5 confers implicitly upon the Government Inspectors, whose duty it is to see to the carrying out of the preventive measures, to examine the processes of manufacture, on the secrecy of which depend, very often, the success of certain industries and their financial results.

The regulations which will accompany the law, may perhaps tend more to allay this alarm and anxiety on the part of the manufacturers, than the fine of 500 fcs. to 1,000 fcs. imposed by the law upon the violators of secrecy, and the prohibition on the inspectors and their deputies against undertaking on their own account or for others any trade whatsoever; an insignificant fine, in view of the material value which the violated secret may possess; an insufficient prohibition, seeing that it cannot be extended beyond the time during which it may please or be convenient to the inspectors and their deputies to occupy their posts.

Of all provisions imposed upon industry, the provision as to inspection is probably the most unjust, seeing that it has its rise from suspicion, or even more from a presumption of dishonesty and resistance to the law, against a very respectable class of citizens, such as the manufacturers and contractors. It is also the most useless, because if humanitarian sentiment, and the fear of civil responsibility to which they are liable in case of accidents, should not be sufficient to restrain manufacturers from transgressing the law, the fines imposed by special laws would certainly not have more effect.

Methods of Compensation.

Accident is a natural consequence of trade; it is therefore upon the trade that the loss must fall in all cases where it is not the deliberate act of the employer or of the workman which contributes to cause the accident, *i.e.*, when there is no fraud. This is substantially

the principle of trade risk, the leading idea upon which the law has established its essential provisions relating to compensation for labour accidents. It is a new principle which has no history, which escapes and, in some points, even runs counter to the rules of ordinary law as regards liability; of which it is not yet known, notwithstanding the endeavours of distinguished lawyers, to what ideas, to what juridical institutions it may be again connected; briefly, it is one of those principles for which from time to time a place must be found in the law, in order to be able to bring into line and conform legislation with the requirements of modern times, with the altered conditions of men and nations, and with the varying principles of policy.

This being so, it would be useless to discuss it from the point of view of equity and rigid justice; it must therefore be examined from the point of view of its timeliness and practical value, before extending its application to other laws of social bearing, which are under consideration with a view of securing to the workmen old age pensions, sickness allowances, wages in case of involuntary strikes, &c.

The first question presenting itself is to know the extent of the financial charge imposed upon national trade by the new law. It is absolutely impossible, in the actual state of affairs, to estimate this charge with sufficient precision and exactness, or, in other words, to fix the average premium required to cover the risk of labour accidents according to the conditions prescribed by the law, and for all the classes subject, in accordance therewith, to obligatory assurance.

The absence of good trade statistics in Italy prevents us from accurately determining the first of the elements required for such a calculation, *i.e.*, the number of workmen divided according to sex and trade, to whom the benefit of obligatory assurance has been conceded, and the average of their daily wages. The statistics of the National Fund for Assurance against Labour Accidents, the only ones existing in Italy in respect of the coefficients of accidents in our industries, apart from the fact that they do not divide the workers by sex and trade, cover a period of time too short and a field of observation too limited to enable us to deduce therefrom reliable probabilities in respect of the various consequences caused by accidents, and the various compensations resulting therefrom. It is, however, necessary to proceed empirically to this calculation, and complete the few data of the Italian statistics by adding thereto the more recent, more extensive, and more correct ones, supplied by foreign statistics, and particularly by the German. In fact, all those had to proceed in this manner, who had to deal with this evaluation in order to refer to or discuss the various Bills on labour accidents submitted to the Chamber of Deputies. This I shall do in taking as basis the statistical data contained in the learned report which the regretted Auriti submitted to the Senate of the Kingdom in February, 1892, in support of the modifications proposed in the Bill of the Minister Chimirri; and I shall complete and adjust them as well as I can to the provisions of the new law.

Senator Auriti had estimated at 1,066,000 the number of workmen who should have been assured pursuant to that Bill. However, owing to the new industries to which the present law extends obligatory assurance (gas companies, electrical companies, telephone establishments); owing to the great development experienced

during the last 15 years, since the last census of 1881, in some of the industries already included in that Bill (arsenals, shipbuilding yards, railways, tramways); owing to the greater use now made of mechanical motors; owing, lastly, to the reduction from 10 to 5 of the number of workmen engaged in one and the same establishment, beyond which assurance is now obligatory in connection with the industries mentioned under clauses 2 and 3 of Art 1; it may be presumed that the number of workers to whom the benefit of assurance is to be extended, pursuant to the present law, is not less than 1,700,000, of whom about two-thirds would be men and one-third women, according to the proportion between the two sexes estimated by Mr. Auriti.

The average daily wage of the workman—the second essential element of the valuation in question—was ascertained by Mr. Auriti to be 2 lires for the men and 1.50 lires for the women.

In the following vicissitudes and the evolution of the principal Italian industries during recent years, it may be presumed that the average of the workmen's wages has increased; however, as the data to fix the actual cost of labour are wanting, we must accept for this brief calculation the above-mentioned averages.

Assuming that the working days in a year amount to 300, the annual average of wages will be 600 lires for the workmen and 450 lires for the workwomen; this, applied to the whole of the workers contemplated in the present law (namely, 1,700,000 workers, of whom two-thirds are men and one-third women), gives an aggregate average wage of 550 lires per annum, and of 1.80 lires per day, and shows a total amount of wages paid annually to the aforesaid workers of about 935,000,000 lires.

More difficult and uncertain still are the investigations in connection with the third and most important element of the calculation, namely, the coefficient of accidents; to define it, the average number of labour accidents occurring yearly, and the various physical consequences resulting therefrom, in relation to the graduation of the compensations assigned respectively by the law, should be known.

Mr. Auriti, by taking as basis the accidents recorded in the German statistics for the three years 1886, 1887, and 1888, and in the Italian for the years 1888, 1889, 1890 and 1891, estimated that the financial charge on the Italian manufacturers, in respect of the number already stated of 1,066,000 workmen, assured in accordance with his Bill, would have been 6,117,677 lires, pursuant to the first of the two sets of statistics, and 5,268,582 lires, pursuant to the second, if the indemnity had to be paid in case of temporary disability, from the first day in connection with all illnesses, including those of short duration. By applying this valuation to the number of 1,700,000 workers, to whom the new law extends obligatory assurance, we arrive, under the same conditions, at a charge of 9,756,145 lires, according to the German statistics, and of 8,401,974 lires, according to the Italian statistics.

It should here be remarked that Mr. Auriti had already concluded that the calculations based upon the German experience were the more trustworthy, seeing that they had as basis a number of lives at risk 36 times greater than were recorded in the Italian statistics of the National Fund against Accidents. By adopting the

coefficients of accidents described above, he deduced therefrom that the annual financial charge in connection with obligatory assurance, within the limits and on the conditions laid down by the Bill, of which he was the Reporter, was equal to one per-cent of the amount of the wages.

Without working out afresh the calculations of Mr. Auriti on the basis of the most recent statistics and of the special provisions of the new law, it can be affirmed with certainty that, according to them, the financial charge in connection with obligatory assurance must be considerably increased. There are many reasons for this. First, it is proven that the number of accidents increases generally in the countries where the assurance of workmen is obligatory. In Germany, from 1886 to 1896 they increased from 10,500 to 86,500; the statistics of the National Fund show likewise an increase, especially as regards slight accidents in respect of which daily compensation has been provided. It is not necessary to dwell upon this in order to prove that if the number of accidents increases, the cost of obligatory assurance increases likewise.

Secondly, the coefficient of accidents on which Mr. Auriti based his calculations has been increased by the differences introduced in the new Law, in relation to the modified Bill of Chimirri, with regard to the extent of the compensations assigned to the victims of accidents. In fact, while in the case of total permanent disability that Bill laid down purely and simply compensation equal to five times the annual wages, the new law provides a minimum of 3,000 lires, which implies an increase in the cost, especially in connection with the accidents to women.

The average wages of workwomen being calculated, as we have already seen, at 450 lires annually, it follows therefrom that the workwoman who, in case of such accident, would have been entitled to a compensation of 2,250 lires, will receive, on the contrary, a compensation of 3,000 lires, pursuant to the new law.

In the case of total temporary disability, the daily compensation, pursuant to the Ministerial Bill of 1891, as amended by the Senate, began from the eleventh day of incapacity to a limit of 360 days; the new law, on the other hand, makes it run from the sixth day of incapacity, and extends it to the whole time it lasts, without any limitation.

The difference of the financial charge owing to this inequality of conditions is very great. It is, however, right to observe that in the brief calculation which I have just made in accordance with the ideas of Mr. Auriti, I have borne it in mind, seeing that I have taken as a point of comparison the probable charge estimated by him at 6,117,670 lires, pursuant to the German statistics, and at 5,268,582 lires, pursuant to Italian statistics; a charge which, indeed, exactly referred to the case in which allowance must be made for all incapacity from the first day of its existence. Bearing this in mind, the charge which I have brought out should be still further reduced in consideration of the five days of delay conceded by the present law; but as the benefit of the delay is reduced to so few days as to render it very slender, and as presumably it is counteracted in its effect by the damage that the concurrent suppression of the limit of 360 days formerly fixed for the longest duration of relief might produce, it seems to me useless

to proceed to a correction which might impair the general results of the calculations.

Finally, in case of death, the new law has recently increased the compensation to a sum equal to five times the yearly wages, whereas the Bill to which the calculations of Mr. Auriti referred, fixed it at only four times the yearly wages. Hence there results a charge even greater than that then estimated.

To all these elements which contribute to increase the percentage of the proportion between the financial charge, resulting to the industry from obligatory insurance, and the amount of the wages, estimated by Mr. Chimirri, at one per-cent, another very important factor must be added which was not taken into consideration by the ex-Minister. I mean the element of expenses, inherent to the charge for assurance, which will always fall upon industry, whether levied in the premium by the assurance companies, or borne directly by the assured manufacturers. An idea of the weight of these expenses may be obtained, by examinining the effects which obligatory assurance has produced in this respect in Germany. Between 1886 and 1892, the costs levied upon the employers, had increased from 4·84 to 12 per 100 units of wages, and in 1895 upon a total of M. 50,000,000 paid in compensation for accidents, a sum of M. 10,000,000 was spent in the shape of remuneration alone to the 30,000 clerks engaged in the assurance service. Even the law costs in connection with disputes between employers and workmen have increased in Germany since the introduction of obligatory assurance, and in 1892 they reached the sum of M. 1,034,929, whereas in 1886 they amounted to M. 207,314 only; *i.e.*, they have increased fivefold. Even while hoping that the capitalization of the compensation adopted by the Italian law will do away with the chief causes of the continuous increase of the costs and of the disputes experienced in Germany, it must always be admitted that the provisions of the new law will impose on industry, independently of the compensation itself, heavy charges.

However, in taking account of the effects that may be foreseen from all these new elements of cost, which must be added to those estimated by Mr. Chimirri, it may be concluded that the opinion expressed, during the debate in the Senate, by Mr. Vitilleschi in opposition to the Bill, was not exaggerated, when he estimated that the annual charge upon industry would be from 10 to 12 million lires.

Whatever may be the reason, and by whatever name it may be called, this sum represents a new and heavy impost upon Italian industry, which, in its present circumstances, cannot bear it without injury or danger; and it will necessarily have to throw the burden partially upon labour and upon the consumers; hence, upon the shoulders of the very class which it was desired to favour by the new law.

The question of the form of the compensation, in the new law, as well as in most of the Bills which preceded it, was solved in a sense quite the reverse of the methods preferred in foreign laws of the same kind, and even in the German law, which was taken as a model as regards the general lines of the Italian law.

This solution was almost forced upon us, owing to the absence in Italy of a Pension Fund for workmen and of mutual associations established between manufacturers for the same purpose. It presents three advantages:

1. To simplify the determination of the assurance premiums which, in the absence of special tables of mortality relating to the employees in the various trades, would have been very difficult and uncertain if the system of annuity payable to the representatives had been applied;
2. To render less serious the consequences of an eventual failure of the assurance institution, by limiting them to the workmen who should happen to meet with an accident during the period of the bankruptcy;
3. To remove, probably, one of the causes under which the expenses and the disputes have grown immeasurably in Germany since the introduction of obligatory assurance.

The spirit of tutelage which inspired the law explains why, in Art. 13 of the same law, an exception was made to this system, by establishing that, in the cases of permanent total disablement, the compensation payable shall, as a rule, be converted into an annuity to be effected with the National Provident Fund for Old Age and Workmen's Disability, which is to be established, and, pending this establishment, with one of the private life assurance companies legally constituted in the kingdom, and selected by the injured workman. As against the advantages just pointed out, the capitalization of the compensation offers a disadvantageous side, the financial effects of which cannot be estimated *à priori*, in that, after the payment of the compensation has been effected, the supervision of the real consequences of the accident ceases, these having been adjusted; and the injury to industry resulting in practice, in case of fraud, remains without remedy; hence, there is a greater facility for, and even an encouragement to, fraud.

Almost all foreign legislators on the subject of labour accidents accepted the resolution agreed to by the International Congress of Berne in 1891, namely, that slight accidents, causing disablement of very short duration, should be excluded from the benefit of assurance, and brought under the provisions relating to sickness in general. As there is in Italy no law, nor public institutions, providing against sickness, it was not desired to sanction an exclusion which would seem to nullify the social aim of the actual law on accidents; and it thus has happened that the assurance premium is charged for even that portion of the eventual accident risk which in all other countries falls generally upon Sickness Funds. No account has been taken of the numerous friendly societies existing in Italy whose object is precisely to indemnify the members in case of sickness, and which would have found, by the exclusion of slight accidents from the assurance benefit, a new source of business and a new force of expansion, coupled with moral advantage to the working classes, who, by a slight sacrifice, would have provided for themselves against the more trifling consequences of labour risk, and have relieved, at the same time, industry, upon which remained the burden of the more severe and serious accidents. In contradistinction to the limit of 15 to 10 days of delay, admitted in preceding Bills, in the approved new law the limit of five days only has been sanctioned, a very small limit, constituting no material saving to industry, as it must be remembered that, by custom and by humanitarian sentiment, the masters always provide the first help

and the initial assistance; and that, on the other hand, it is precisely in connection with slight accidents that frauds are more frequent, and that concealment as regards the duration of the illness is most easy. We have already seen above what is the financial result of this provision of the present law, while trying to arrive at the estimated amount of the resulting annual charge upon industry, and it is unnecessary to refer to it again.

And now I reach the most serious of the questions connected with the subject, to that which has excited the most lively and the longest discussions at Congresses, and regarding which the discussions, instead of calming down, have become, in Italy, still more stormy since the solution arrived at in Arts. 22 and 23 of the present law:—namely, the question called by experts *grave fault*. According to the origin of the theory of trade risk, it seemed that the field of operations should be restricted to those accidents which, due to superior force, to fate, or to uncertain causes, might be considered as merely unavoidable consequences of labour. A law confining the application of the new theory within these limits, could not have failed to be advantageous, seeing that (according to existing statistics) it would have provided for about half of the general accidents of labour, and precisely that half for which compensation could not be recovered under the ordinary law. Yet such a law would not have satisfied either the workmen or the employers, because, as regards the other half of the accidents, those due to faults more or less grave, the compensation, under ordinary circumstances, could neither be determined nor granted, except as the result of a judicial decision fixing the responsibilities.

But such judgments present, from the legal point of view, great difficulties in the proving of the fault, and in determining its gravity; from the social point of view, they possess the very great drawback of maintaining in perpetual antagonism the interests of the workmen and those of the employers; and from the economic point of view, that of causing to the workmen, and to their families, long and prejudicial delays in the payment of the compensation if the fault is that of the employer, and great expense to the employer if the fault is that of the workman.

To obviate these drawbacks, and to preserve to the law on labour accidents its politic object, *i.e.*, to reconcile labour and capital, it was necessary to depart from the rules of ordinary law in respect of civil responsibility. It thus has happened that, from an attempt to alter the burden of proof, we arrived, step by step in the various schemes, at an extension of the principle of trade risk even to accidents due to a fault, by admitting them all to the benefit of assurance, except in the case of fraud. The workman, victim of an accident due to his own negligence, to his disobedience to the regulations of the establishment or of the law, to causes dependent on his will, has acquired thus the right to compensation which has to be borne by the master by reason of his being obliged to pay the assurance premium. This provision may be explained by the sentiment of humanity and pity which is evolved from the thought of the sad consequences accruing by the accident to the culprit and to his innocent family; but from the point of view of right, logic, and equity, there is not and there never will be any legal sophism capable of justifying it. The opponents of this principle

have not failed to point out that, by suppressing the responsibility of the workman, he was injured in his character as a man, that there was suppressed at the same time a great motive in life, a powerful element of progress; that we rendered useless and unjust, the burden of preventive measures against accidents imposed upon the employers. These objections, and others, were of no avail; the example set by Germany has been allowed to prevail, and the idea that the time was opportune for the political aim of the law, by which was sanctioned the absolute irresponsibility of the workman in respect of accidents, except in the sole case of fraud, proven by means of criminal conviction.

This exception to the ordinary rules of civil responsibility, established in favour of the workman, threw a much greater burden on the master, who was compelled to assure him; and it seemed fair to grant to the latter some compensation by exonerating him in his turn from every civil responsibility towards the workman in respect of the injury due to the accident, which had already been made good by means of the obligatory assurance. But when the question is to assist the manufacturer, neither the example to the contrary of Germany, nor the object of social conciliation which it was desired to attain by the law, influenced the legislator, who, in Arts. 22 and 23 already quoted, threw on the master, in addition to obligatory assurance, the civil responsibility pursuant to the rules of ordinary law, by exonerating him only when the sentence in respect of the fault "*had been passed "for a crime, regarding which criminal proceedings could not be insti-"tuted without an application for leave to prosecute*", or, in other words, when the illness caused by the accident did not extend beyond ten days.

The supporters of the new law endeavoured to justify it by several reasons, which would certainly not have convinced the Chamber of Deputies, if the latter, for reasons referred to at the beginning of this Paper, had not been more anxious to have done with it than to examine and improve its clauses. Amongst other things, they said that, if in Germany the question as to grave fault had been solved with a view of assisting the master as much as the workman, that was possible there, because there existed in that country a complete system of social laws for the protection of the workman—a system still absent from Italy; and because there were there a series of very minute regulations, the observance of which is guaranteed by stringent inspections and heavy penalties. But they failed to notice that in this manner they weakened all the other principal provisions of the new law borrowed from the German law, and that they depreciated the preventive measures inserted in the law. They said also that the principle of the civil liability of the employer was admitted in a very recent law passed in England, when the accident was caused through negligence; but, on the other hand, this law sanctioned the forfeitnre by the workman of the right to compensation when the accident was caused by deliberate and continuous bad conduct. Now, by this phrase, according to the interpretation of English law and jurisprudence, the right to compensation is excluded in the case of one of the most frequent and general causes of accidents occasioned by the fault of the workman, namely, drunkenness.

They also said that statistics have shown that the number of accidents caused through a grave fault of the employer is so small

(from 5 to 6 per-cent) that the financial burden on industry, which would have resulted from the retention of civil responsibility in these cases, would have been very slight. And they added, likewise, that the employer might have relieved himself of this civil responsibility by special assurances with private companies charging, therefor, small premiums. But this contention, which does not do away with the injustice towards the class of employers, is a condemnation of the distrust which the legislator has shown towards that class, by enacting the preventive measures against accidents.

Moreover, that which affects industry, in connection with the financial burdens retained at its charge in the sole case of fault on the part of the employer, is not so much the thought of the compensation which will fall upon it on that account, nor that of the assurance premium which it will have to defray in order to be relieved therefrom, but the thought of the numerous lawsuits to which this provision opens the door, and of which the workman will avail himself more readily than formerly, seeing that now he will find, in the compensation received by means of assurance, a greater encouragement to resort to legal proceedings against his master, and better means of constituting himself a civil party to such a suit, in order to obtain a second compensation for the same accident. True, it may be assumed that, in view of the obligatory assurance and the compensation resulting therefrom to the workman who has met with an accident, whatever may be the cause, provided there be no fraud, that sense of pity will be diminished in the mind of the magistrates, which, until now, induced them to throw upon the manufacturer the onus of every accident as the only means of helping the victim pursuant to the Code; similarly, it may be assumed that there was such a tendency which induced the magistrates, almost against their will, to be more severe in fixing the extent of civil responsibility, when they had to place it to the account of the employer. But, however reasonable that may be, we have here a mere hope, which may or may not be realized, and under the best circumstances, the effect will be to diminish, but not to prevent, the increase in the lawsuits, which is to be feared. Consequently, the main object of the law under consideration, has failed, seeing that, as I have already said, that object should be to reconcile the interests of two opposing classes, and to render more amicable the relations between masters and workmen.

As to the manner of procuring the assurance, the Senate discarded, very appropriately, the monopoly upheld in his Bill by Ex-Minister Guicciardini in favour of the National Assurance Fund against Labour Accidents, established by the law of the 8th July 1893. The manufacturer is thus at liberty to make use of this Fund, or of the Syndicates which may be constituted, if need be, by the manufacturers themselves, or of one of the assurance institutions legally authorized to operate in the Kingdom. The compulsion to assure with the National Fund has been retained by the law solely for works carried on for account of the State, of the Provinces, or of the Communes. A regulation, which is not yet known, will lay down the rules and fix the deposits to which private companies and Syndicates will be subject in order to carry on assurance against labour accidents.

The freedom thus allowed of selecting the assurance institution is in accordance with the liberal principles which predominate in

Italian law in connection with competition. Besides, it has the advantage of respecting all organizations already existing, as well as those which may be established as associations among the industries presenting the same degrees of risk.

The National Fund, established in Milan in 1883–1884, with the co-operation of the ten best saving banks of the Kingdom, which provided it with a guarantee fund of 1,500,000 lires, has enrolled already more than 170,000 assured workmen. As it has no speculative aim nor large expenses of management, it can carry on assurance at very moderate premiums; and it has thus the advantage of preventing the private companies from combining, with a view of imposing upon the public high tariffs rather than competition. As regards material guarantees, the National Fund does not occupy a better position than the chief private accident companies which are competing with it, either as regards the amount of its capital, or its financial strength, seeing that the 1½ millions of guarantee fund must be refunded, according to strict law, to the promoting institutions out of the annual profits of its business. No one can deny the boon conferred upon the country by the establishment of the National Fund, and the still greater boon which it will render when the labour accident law shall come into force. However, it would be unfair to overlook that, side by side with the National Fund, the private assurance companies have certainly well deserved of the country, by assuring, in the aggregate, a number of workmen little short of its own (*i.e.*, 130,000), and providing for the adjustment and payment of compensation with perfect regularity.

Syndicates, authorized by law, may be established, and may carry on their operations amongst the wealthiest and least hazardous industries; and they will, likewise, be very useful, provided, however, that there be included in the regulations respecting them efficacious and sufficient provisions and deposits to secure their solvency and the safety of their operations, and in order to prevent their giving rise to the inconveniences which so many times have been deplored in connection with the minor mutual and co-operative societies engaged in other branches of assurance.

The principal defects of the law, which I have pointed out, had already been exposed and opposed by eminent jurists and economists at Congresses, and in debates in the national and foreign legislative assemblies, on the numerous draft schemes which preceded the new Italian law on labour accidents, which has just been passed. Notwithstanding this, and despite the avowed presentiment, even of the promoters and supporters of the law, that they were turning out imperfect and defective work, the Italian Chamber, going in advance of the experience of other countries, and of mature studies on this subject, determined to sanction it, for reasons I mentioned at the beginning of this Paper.

By what precedes, I do certainly not propose to affirm that the law, as finally passed, will not result in any boon; and the last or the least will not be to stimulate the assurance institutions and industrial syndicates to examine and apply all possible means of minimising the consequences of accidents. The creation of special ambulances to attend to traumatic injuries, of which Milan set so nobly the example, will probably extend to all the great centres of the country, and find in the philanthropy

of the inhabitants moral and material support. Thus, by promptly applying a remedy, the advantage will be afforded to the workmen and to trade of preventing the excessive development of the consequences of accidents, and of curtailing the time of disability from work.

Now that I have completed the task I undertook, there only remains for me to explain why I wished to dedicate my Paper to the second Congress of Actuaries. Amongst the questions submitted by the Organizing Committee of the Congress, there is one on "Legislation in Relation to Life Assurance", with which the theme I have here enlarged upon may have some points of contact; and another on "Compensation to Workmen for Accidents", with which it is more directly and intimately connected. The Council of the Italian Association for the Advancement of Actuarial Science, recently established at Milan, recommended its members to co-operate in the work of the Congress, and suggested to them, amongst other things, in preparing a Paper on the subject of accidents, to deal with the enquiries, and draft laws, relating to obligatory assurance against disablement. I thought that a critical and impartial examination of the principal provisions of the Italian law just passed would not go beyond the aim proposed by the Congress, nor the recommendation of the Council of the Italian Association of Actuaries, to which I have the honour to belong. The mission of actuaries, in connection with the question of assurance against labour accidents, is undoubtedly important; but they have not yet been able to gain a hearing, owing particularly to the serious controversies which have revealed themselves in Congresses and in legislative assemblies in connection with the question of obligatory or optional assurance, of the limits of the application of such assurance, of the extent and the form of the compensation to the victims and their families, and of other fundamental elements as to the classification and rating of the various risks.

For this need, the private assurance companies and the syndicates can only provide provisionally and empirically. It pertains to the Actuaries to collect and classify the necessary statistical data, and to proceed in accordance with these data to the scientific estimation of the risks and of the relative premiums, carrying out for accident assurance the admirable work which they have already done in connection with life assurance. For Italy, the system of the capitalization of the compensation adopted in the new law has much simplified this task, by removing many contingencies which would have had to be considered in connection with the calculation of probabilities if the German method as to pensions had been followed. Nevertheless, as regards permanent total disablement, the difficulty arises again, owing to Art. 13; and it should be solved speedily, both in the interest of the private assurance companies and in that of the National Provident Fund for Old Age and Workmen's Infirmity, which is to be established, because they are expected to grant annuities on the basis of new elements which are not met with in the general statistics of the population nor in the ordinary life tables.

However, I am wrong in continuing my explanation of the duty of actuaries in view of the new and special assurance branch against labour accidents, being aware that they are already preparing to face it with the enthusiasm, zeal, and constancy, which are the characteristics

of those cultivating and directing a positive science of the most difficult and serious nature, and having in view the noble and philanthropic object of social improvement. Many of the questions which now divide legislators and economists with regard to the methods, the extent, and the limits of compensation to be granted to those who are victims of labour accidents, without injuring, in capital, the original source of labour itself, will not finally be solved until the actuaries shall have examined and shown mathematically the financial consequences thereof. To arrive at this, they must obtain a clear and full notion of these questions, and it is certainly with this object in view, that, in the agenda of the International Congress of London, a prominent place has been allotted to the question of labour accidents. I have endeavoured to set forth the points of this subject regarding which discussions and uncertainties are still rife in Italy, notwithstanding the solution which the law now about to come into operation has given them. If my labour, in any degree, should directly or indirectly aid towards attaining the end which the Congress has set itself, I shall be satisfied in feeling that this modest Paper has not been altogether useless. In any case, my respected colleagues in the Congress will kindly forgive me, in view of the good intentions which induced me to write the paper and dedicate it to them.

Le Projet de Loi belge sur la Réparation des Dommages résultant des Accidents du Travail; par O. Lepreux, *Directeur Général de la Caisse Générale d'Epargne et de Retraite.*

J'ai le plaisir de faire connaître au Congrès, avec l'autorisation de M. Nyssens, Ministre de l'Industrie et du Travail de Belgique, les grandes lignes d'un projet de loi sur la réparation des dommages résultant des accidents du travail, projet qui vient d'être déposé sur le Bureau de la Chambre des Représentants.

A proprement parler, il ne s'agit pas d'une loi d'assurance, mais d'une loi d'indemnité, établissant le principe du risque professionnel, fixant la limite et les conditions de la réparation du dommage, le droit à cette réparation résultant du contrat de travail; à ce point de vue, le projet de loi belge présente quelque similitude avec la loi promulguée récemment en Angleterre.

Je crois devoir signaler à l'attention toute spéciale du Congrès les articles* 2 et 3 du projet en question qui sont relatifs à la réparation du dommage, soit dans le cas d'invalidité permanente ou temporaire, soit dans le cas de décès.

Dans le premier cas, l'indemnité consiste en une rente qui sera servie à la victime de l'accident, et qui sera fixée à la moitié du salaire avant l'accident, si l'incapacité est totale, ou à la moitié de la différence entre le salaire avant l'accident et le salaire après l'accident, si l'incapacité est partielle.

Dans le second cas, l'indemnité sera la valeur, à l'âge de la victime, d'une rente fixée selon le nombre d'ayants droit, à une quotité variant de 5 à 30 pour cent du salaire dont jouissait le sinistré.

Les indemnités sont donc, dans tous les cas, fonction de l'âge du sinistré, et non de l'âge de ses ayants droit, en cas d'accident mortel; en capital elles sont déterminées d'après la formule $Ka_x S$; K étant le coefficient de réduction du salaire, et S étant le salaire. En ce point le projet de loi belge diffère de la loi autrichienne, qui fixe les indemnités en cas de décès en rentes reposant sur la tête des ayants droit.

Il n'est pas douteux que les dispositions du projet de loi belge ne soient de nature à faciliter, dans une large mesure, l'évaluation des charges résultant des accidents.

Sans doute il faudra, pour le moment, se contenter de certains

* On trouvera dans l'appendice, à la fin de ce rapport, les articles ci mentionnés.

éléments imparfaits, par exemple en ce qui concerne la détermination de K, qui peut varier pendant tout le temps que dure l'invalidité partielle. Mais la statistique permettra de perfectionner ces éléments dans l'avenir, et de déterminer, entre autres, la probabilité qu'un accident entraîne—

Une rente égale à 10 à 20 pour cent de S,
„ „ 20 „ 30 „ „
„ „ 30 „ 40 „ „
„ „ 40 „ 50 „ „

etc., par groupes d'industries similaires.

L'article 3 prescrit de quelle façon la valeur de la rente, qui forme l'indemnité en cas de décès, doit être liquidée au profit des ayants droit de la victime.

On conçoit aisément que, dans ces conditions, il est possible de séparer nettement l'organisme assureur, qui aura la charge de constituer les indemnités, et l'organisme qui aura pour simple fonction de vendre des rentes. Le premier ferait de l'assurance *temporaire de 1 an* contre les accidents, et recevrait des primes *temporaires de 1 an* qui seraient calculées de manière à lui permettre de disposer des capitaux constitutifs des rentes, lesquels seraient versés à l'institution vendeuse de rentes. Ce système aurait l'avantage considérable de permettre une révision, pour ainsi dire annuelle, des tarifs des primes.

L'organisme assureur contre les accidents pourra être, soit une compagnie d'assurances privée, soit une Caisse commune de prévoyance que les chefs d'entreprises auront la faculté d'établir conformément à l'article 16 du Projet. Cependant, le projet fait une différence marquée entre l'assurance contractée à une Caisse commune et celle qui serait contractée à une société privée; dans le premier cas, l'employeur est entièrement dégagé de toute responsabilité: en cas de sinistre, l'assureur, qui est la Caisse commune, a pleine responsabilité de la liquidation des indemnités; dans le second cas, l'employeur reste responsable et le sinistré peut, si la société privée à laquelle l'employeur s'est adressé, est insolvable, attraire celui-ci devant les tribunaux.

On pourrait se demander si cette distinction est bien justifiée, et s'il ne vaudrait pas mieux traiter de la même manière les Caisses communes et les sociétés privées, en les soumettant toutes à des conditions rigoureusement fixées par la loi et analogues à celles qui sont énumérées à l'art. 16 du Projet.

Le service des rentes qui constitueront les indemnités sera fait par la Caisse Générale d'Epargne et de Retraite, par les Caisses communes elles-mêmes, ou par des compagnies privées agréées par le Gouvernement.

Aux termes de l'art. 18, les statuts des Caisses communes de prévoyance pourront stipuler que les allocations temporaires ainsi que les arrérages des rentes viagères du chef d'incapacité permanente seront, jusqu' à la 26e semaine après l'accident, directement supportés et payés à l'intéressé par le chef d'entreprise. Il est très probable que les Caisses communes se prévaudront de cette disposition, car les suites des accidents donnant lieu aux indemnités temporaires seront beaucoup mieux appréciées par les chefs d'entreprises eux-mêmes: le délai de 26 semaines semble nécessaire pour que l' on puisse se rendre compte du caractère permanent et du degré de l'incapacité.

Telles sont les principales dispositions du projet de loi belge qui paraissent de nature à intéresser le Congrès. J'estime qu'il serait inopportun de les discuter. Je pense que les membres du Congrès auront trouvé quelque intérêt dans l'exposé succinct que je viens de faire, et qu'ils reconnaîtront que le projet de loi belge contient, au point de vue technique, des dispositions qui constituent un véritable progrès sur tout ce qui a été tenté en cette matière jusqu' à présent.

Je ne doute pas que le Congrès s'associe à moi pour remercier M. Nyssens, Ministre de l'Industrie et du Travail de Belgique, qui m'a autorisé gracieusement à donner au Congrès communication du projet qui vient d'être élaboré.

APPENDICE.

Voici les articles du Projet de loi sur la Réparation des Dommages résultant des Accidents du Travail, qui sont mentionnés dans le Rapport ci-dessus.

ART. 2.—Lorsque l'accident a été la cause d'une incapacité temporaire et totale de travail de plus de deux semaines, la victime a droit, par semaine, à partir du quinzième jour qui suit l'accident, à une indemnité égale à 50 p. c. de son salaire hebdomadaire moyen.

Si l'incapacité de travail est ou devient partielle, cette indemnité doit être équivalente à 50 p. c. de la différence entre le salaire hebdomadaire moyen de la victime antérieurement à l'accident et celui qu'elle est capable de gagner avant d'être complètement rétablie.

Si l'incapacité est ou devient permanente, une rente viagère de 50 p. c., déterminée d'après le degré d'infirmité conformément aux dispositions précédentes, remplace l'allocation temporaire, à compter du jour où, soit par l'accord des parties, soit par un jugement définitif, il est constaté que l'incapacité présente le caractère de la permanence.

ART. 3.—Lorsque l'accident a causé la mort de la victime, soit avant, soit après la constitution de l'indemnité ou de la rente viagère prévue à l'article 2, il est alloué les indemnités suivantes :

1° Une somme de 50 francs pour frais de funérailles ;

2° A la veuve non séparée ni divorcée, une somme représentant la valeur d'une rente viagère à l'âge du défunt, au moment du décès, égale à 20 p. c. du salaire hebdomadaire moyen ;

3° Aux enfants légitimes ou naturels reconnus, âgés de moins de 15 ans, ainsi qu'aux ascendants dont la victime était l'unique soutien au moment du décès, une somme représentant au total la valeur d'une rente viagère déterminée comme il est dit ci-dessus, et égale à autant de fois 5 p. c. du salaire hebdomadaire moyen qu'il y a d'ayants droit de cette catégorie.

La somme des indemnités allouées en vertu des 2° et 3° du présent article ne peut, en aucun cas, dépasser la valeur d'une rente viagère égale à 30 p. c. du salaire hebdomadaire moyen et calculée comme il vient d'être dit.

Le conjoint et les enfants ont la priorité sur les ascendants : l'ascendant le plus proche sur le plus éloigné.

En cas de concours entre plusieurs ayants droit, l'indemnité allouée à chacun d'eux est réduite à due proportion, s'il y a lieu, dans les limites du disponible.

Le conjoint et les enfants naturels n'ont droit à la rente que si le mariage ou la reconnaissance ont eu lieu avant l'accident.

Les survivants d'un étranger qui, au moment de l'accident, n'avaient pas leur résidence habituelle sur le territoire belge, ne sont admis à réclamer les indemnités établies par le présent article que si les Belges jouissent de semblable avantage dans le pays d'origine de l'étranger, sans condition de résidence.

Art. 6.—Les allocations déterminées aux articles qui précèdent sont à la charge exclusive du chef d'entreprise.

Les parties ont la faculté de convenir que des suppléments d'allocation seront accordés, sans toutefois que les indemnités temporaires ou viagères puissent être supérieures au montant du salaire moyen. Lorsque, dans ce cas, le chef d'entreprise contracte une assurance contre les accidents ou constitue en faveur de ses ouvriers une caisse de secours dont l'organisation a été approuvée par la Commission des accidents du travail, il a le droit de retenir sur les salaires une somme équivalente à la partie de la prime ou de la cotisation correspondant au montant du supplément stipulé.

Art. 16.—Les chefs d'entreprise ont la faculté d'établir des caisses communes de prévoyance en vue de s'assurer contre les risques d'accidents et d'assumer en commun, aux lieu et place de la Caisse générale d'épargne et de retraite, le service des rentes ainsi que la constitution et la gestion des capitaux nécessaires à ce service.

L'exercice de cette faculté est subordonné à la reconnaissance de ces caisses par le Gouvernement. A cet effet, elles sont tenues de soumettre leurs statuts à l'approbation du Roi.

Des arrêtés royaux détermineront :

1° Les garanties et conditions requises pour cette approbation ;
2° Les causes qui pourront entraîner la révocation de l'acte d'approbation ;
3° Les formes et conditions de la dissolution ainsi que le mode de liquidation ;
4° L'emploi de l'actif, après paiement des dettes, en cas de révocation ou de dissolution.

Toutes demandes relatives à la reconnaissance des caisses communes de prévoyance seront soumises à l'examen de la Commission des accidents du travail.

Art. 17.—L'affiliation à une caisse commune de prévoyance reconnue a pour effet de transférer à cet établissement la charge des obligations incombant aux affiliés en vertu de l'article 6, alinéa 1er, de la présente loi.

L'assurance des suppléments d'indemnités prévue au même article pourra être prise, par les affiliés, auprès des caisses dont ils font partie, auquel cas les indemnités supplémentaires seront directement recouvrées sur ces caisses, à la décharge du chef d'entreprise.

Art. 18.—Les statuts des caisses de prévoyance reconnues pourront stipuler que les allocations temporaires ainsi que les arrérages des rentes viagères du chef d'incapacité permanente seront, jusqu'à la vingt-sixième semaine après l'accident, directement supportés et payés aux intéressés par le chef d'entreprise.

Le service des suppléments d'indemnités pourra, dans les mêmes conditions, n'être assumé par la caisse commune de prévoyance qu'après l'expiration du délai prévu par la disposition précédente. En pareil cas, s'il est effectué des retenues sur les salaires, en vertu de l'article 6 de la présente loi, les chefs d'entreprise seront tenus d'établir des caisses particulières de secours alimentées, jusqu'à due concurrence, par ces retenues, et dont l'organisation sera conforme aux règles prescrites, à cet effet, par les statuts des caisses communes.

Les caisses particulières seront soumises au contrôle de l'administration des caisses communes.

Translation.

On the Belgian Bill on Compensation for Injury caused by Labour Accidents. By O. Lepreux, *General Manager of the Caisse Générale d'Epargne et de Retraite.*

I have the pleasure to bring before the Congress, with the sanction of M. Nyssens, Trade and Labour Minister of Belgium, the broad lines of a Bill on Compensation for Injuries arising from Labour Accidents, a Bill which has just been placed on the table of the House of Representatives.

Strictly speaking, there is not in question an Assurance Law, but a Compensation Law, establishing the principle of trade risk, fixing the limit and the conditions of compensation for injury, the right to such compensation arising out of the labour contract; from this point of view the Belgian Bill presents some similarity to the law recently passed in England.

I must call the special attention of the Congress to Clauses* 2 and 3 of the Bill in question, which relate to compensation for injury, whether in the case of permanent or temporary disablement, or in the case of death.

In the former case, the compensation consists of an annuity payable to the sufferer from the accident, and which is to be fixed at one-half of the wages previous to the accident if the disablement be total, or to one-half of the difference between the wages previous to the accident and the wages after the accident, if the disablement be partial.

In the latter case, the compensation is to be the value, at the age of the victim, of an annuity, determined according to the numbers entitled, of a proportion varying from 5 per-cent to 30 per-cent of the wages earned by the deceased.

The compensation is, therefore, in every case, a function of the age of the victim, and not of the age of his beneficiaries, in the event of a fatal accident. Its capital value is ascertained by the formula Ka_xS; where K is the coefficient of reduction in the wages, and S the amount of the wages. In this particular the Belgian Bill differs from the Austrian law, which fixes the compensation in the event of death as an annuity depending on the lives of the beneficiaries.

* The Clauses here mentioned are given in the Appendix at the end of the Paper.

Unquestionably the provisions of the Belgian Bill are of a kind to facilitate in a large degree the evaluation of the liabilities arising from accidents.

Doubtless, for the present, we must be content with a certain amount of imperfection in our methods; for instance, in determining K, which may vary throughout the whole period of partial disablement. But statistics will enable us in the future to improve our methods, and to ascertain, among other things, the probability that an accident will involve—

An annuity of 10 to 20 per-cent of the wages,
" " 20 " 30 " " "
" " 30 " 40 " " "
" " 40 " 50 " " "

according to groups of similar trades.

Clause 3 prescribes in what way the value of the annuity, which forms the compensation in case of death, is to be arrived at for the benefit of the representatives of the victim.

It will easily be seen that in these circumstances it is possible to distinguish clearly between the organization of the assurer, charged with providing the compensation, and the organization whose sole function it will be to sell the annuities. The former will grant an assurance, *temporary for one year*, against accidents, and will receive the premiums, *temporary for one year*, which will be calculated in such a way as to provide the capital sums required to set up the annuities; which sums will be paid over to the Institution selling annuities. This system will possess the great advantage of allowing for the revision, so to say annually, of the rates of premium.

The organization of the assurer against accidents may be either a private assurance company, or a joint Provident Fund, which the employers will be permitted to establish under Clause 16 of the Bill. Nevertheless the Bill draws a marked distinction between an assurance effected with a joint Fund and one contracted with a private company. In the former case, the employer is entirely freed from all liability; in the event of an accident, the assurer, who is the joint Fund, bears the whole responsibility of providing the compensation. In the latter case, the employer remains liable, and the sufferer may, if the private company to which the employer had had recourse becomes insolvent, proceed against the employer in the law courts.

It may well be asked whether this distinction can be defended, and whether it would not be better to treat the joint Funds and the private companies in the same way, by subjecting them all to strict conditions laid down by law, and analogous to those set forth in Clause 16 of the Bill.

The payment of the annuities which will constitute the compensation will be made by the Caisse Générale d'Epargne et de Retraite, by the joint Funds themselves, or by private companies approved by the Government.

In accordance with Clause 18, the rules of the joint Provident Funds may stipulate that temporary allowances, as also the instalments of life annuities arising under the head of permanent disablement, up to the 26th week from the accident, shall be borne directly and paid to the beneficiaries by the employers. It is very likely that the joint Funds will avail themselves of this provision, because the results of

accidents giving rise to temporary compensation can be much more easily measured by the employers themselves; and the delay of 26 weeks seems necessary in order to ascertain the permanent nature and the degree of disablement.

Such are the main provisions of the Belgian Bill, which seem to be of a character to interest the Congress. I think it would not be opportune to discuss them. I think that the Members of the Congress will have found something to interest them in the brief analysis which I have made, and that they will recognize that the Belgian Bill contains, from the technical point of view, provisions which form a real advance on anything attempted in this direction hitherto.

I do not doubt that the Congress will join with me in thanking M. Nyssens, Trade and Labour Minister of Belgium, who has so courteously allowed me to bring before the Congress the Bill just drafted.

APPENDIX.

The following are the Clauses of the Bill on Compensation for Injury caused by Labour Accidents, which are mentioned in the foregoing Paper.

Clause 2. When an accident has caused temporary and total disablement from work, lasting more than two weeks, the sufferer has the right, per week, starting from the fifteenth day after the accident, to compensation equal to 50 per-cent of his average weekly wages.

If the disablement from work is or becomes partial, this compensation is to be equal to 50 per-cent of the difference between the average weekly wages of the sufferer previous to the accident and those which he is able to earn before being completely restored to health.

If the disablement is or becomes permanent, a life annuity of 50 per-cent, determined according to the degree of disablement in conformity with the foregoing provisions, takes the place of the temporary allowance, starting from the day on which, either by agreement between the parties, or by a judgment of the courts, it is ascertained that the disablement is of a permanent character.

Clause 3. When the accident has caused the death of the victim, either before or after the determination of the compensation or of the life annuity laid down in Clause 2, the following compensations are to be granted :—

1. The sum of 50 francs for funeral expenses.
2. To the widow, not separated nor divorced, a sum representing the value of a life annuity at the age of the deceased, at the moment of death, equal to 20 per-cent of the average weekly wages.
3. To the legitimate or recognized illegitimate children, aged less than 15 years, as also to the progenitors of whom the victim was the sole support at the time of his death, a sum representing in all the value of a life annuity, determined as aforesaid, and equal to as many times 5 per-cent of the average weekly wages as there are beneficiaries of this class.

The amount of compensations granted in virtue of 2 and 3 of this clause must not in any case exceed the value of a life annuity equal to 30 per-cent of the average weekly wages and calculated as above.

The married partner and the children take priority over progenitors: the more nearly related progenitor over the one more remote.

In case of competition between several beneficiaries, the compensation to be allowed to each is to be reduced proportionately, if need be, within the limits available.

The married partner and the illegitimate children have right to compensation only if the marriage or the recognition took place previous to the accident.

The survivors of a foreigner, who at the time of the accident had not their usual residence on Belgian territory, are entitled to claim the compensations granted under this clause, only if Belgians enjoy similar advantages in the country of origin of the foreigner without conditions as to domicile.

Clause 6. The allowances set forth in the preceding clauses are a liability exclusively of the employer.

The parties may agree that supplementary allowances shall be paid, provided always that the compensation, temporary or for life, shall not exceed the average amount of the wages. When in such cases the employer effects an assurance against accidents or establishes, for the benefit of his workpeople, a Benefit Fund of which the organization has been approved by the Commission on Labour Accidents, he is entitled to deduct from the wages a sum equal to that part of the premium or of the contribution corresponding to the amount of the agreed supplementary allowance.

Clause 16. Employers are permitted to establish joint Provident Funds for the purpose of assuring themselves against the risk of accidents, and to undertake among themselves, instead of and in substitution for the Caisse Générale d'Epargne et de Retraite, the payment of the annuities as well as the provision and management of the capital sums necessary for this purpose.

The exercise of this power is conditional on the approval of these Funds by the Government. For this purpose they are required to submit their Rules for the approval of the King.

Royal decrees will decide—

1. The guarantees and conditions requisite to obtain such approval.
2. The circumstances which may lead to the revocation of such approval.
3. The methods and conditions of dissolution, as well as the mode of winding-up.
4. The application of the assets, after payment of the debts, in case of revocation or winding-up.

All applications relative to the recognition of joint Provident Funds must be submitted for the consideration of the Commission on Labour Accidents.

Clause 17. Affiliation to an approved joint Provident Fund has the effect of transferring to such Fund the liability for the obligations falling on such affiliated persons under the first paragraph of Clause 6 of this law.

The assurance of the supplementary compensation provided for in the same Clause, may be placed by affiliated persons with the Funds to which they belong, in which case such supplementary compensation shall be recoverable directly from such Funds, thus relieving the employer from liability.

Clause 18. The Rules of approved Provident Funds may stipulate that the temporary allowances as also the instalments of life annuities arising from permanent disablement, shall be, up to the twenty-sixth week after the accident, directly borne, and paid to the beneficiaries, by the employer.

The liability for Supplementary Compensation need not be, under the same conditions assumed by the joint Provident Fund until the expiration of the period of delay arranged for in the foregoing provisions. In such case, if deductions have been made from the wages under Clause 6 of the present law, the employers shall be bound to establish special Assistance Funds, to which shall be paid the full amount of such deductions, and the organization of which shall conform to rules laid down, for this purpose, in the Rules of the joint Funds.

The special Funds shall be under the control of the management of the joint Funds.

Discussion *of Papers on Compensation to Workmen for Accidents.*

The Chairman (Mr. Manly, London) said they had before them a collection of very valuable papers upon a subject which was affecting the interests of workmen throughout the civilized world, and one which all Governments had had under practical consideration. It was an evolution of modern civilization, when Governments, in their desire to look after the welfare of the citizens, had passed laws, or were contemplating passing laws, for their protection. The citizens—especially the working-classes—those who work with their hands and muscle, were, after all, the bone and sinew of the State. They constituted the working element and the fighting element; and Governments had found it to their interests to pay attention to the demands of the working classes in this matter. But, so far as the actuary is concerned, the question is yet in an almost experimental stage. There are problems connected with it which are difficult, and the whole question formed, he thought, a large field for the exercise of the abilities of the actuary in reducing many of the problems to a satisfactory solution. He was sure that a careful examination of the papers, when printed in the Transactions of the Congress, would afford a most interesting study, and one which would prove the great advantage which had accrued from the present Session of the International Congress.

Dr. Schaertlin (Switzerland) thought that it was important to consider, at the outset, which system, Freedom or Compulsion, should be adopted. Several countries which, until lately, had been opposed to Government insurance, were now more and more tending in that direction. That is being done gradually, by giving way on certain points. For instance, with regard to accidents, the great principle of the ordinary law is that no one shall be held responsible for anything but his own acts and their consequences. This principle in many instances, especially in Norway and Austria, has been given up; and, instead, there has been substituted the principle that the employer is absolutely responsible for all accidents, even those caused by the man who claims compensation. Dr. Schaertlin thought that the introduction of this new principle must lead to Government undertaking the insurance, although he himself was unwilling to go so far. But he thought that if Government insurance be introduced, that should be done on right and proper actuarial principles. He thought that all members of the Congress should carefully consider the question from this point of view, so as to be able to assist the Governments over the many difficulties that existed.

Les Pensions de Vieillesse en Belgique

PAR O. LEPREUX.

La question des pensions de vieillesse préoccupe aujourd'hui la plupart de ceux qui ont la charge d'un personnel plus ou moins nombreux dont ils utilisent l'intelligence ou les bras, soit pour l'administration de services publics, soit en vue de la recherche d'intérêts privés. Il n'est plus besoin de démontrer que le travailleur, usé, meurtri par de longues années de labeur, ne peut être voué à l'abandon, à la misère, et qu'il doit, au contraire, jouir d'un minimum de bien-être suffisant pour assurer, aux dernières années de sa vie, la dignité dans le repos, couronnement de la dignité par le travail. Mais si l'on reconnaît généralement qu'une administration, un patron, doivent à ceux qu'ils employent, outre la rémunération immédiate adéquate aux services rendus, un complément de traitement ou de salaire destiné à constituer ou à compléter la pension de vieillesse, on est loin d'être d'accord en ce qui concerne la constitution de cette pension. Si l'on examine les règles qui commandent les divers services de pensions de vieillesse en Belgique, on est bien vite amené à reconnaître et à déplorer que, dans cette partie du domaine de la prévoyance, comme dans bien d'autres, on ne tient nul compte des exigences techniques. Seule, la Caisse Générale de Retraite sous la garantie de l'État, instituée par les lois du 8 mai 1850 et du 16 mars 1865, échappe à cette constatation.

Nous pensons qu'il est utile d'étudier successivement, dans l'ordre suivant, les divers systèmes en vigueur ou proposés en Belgique:

A. Administrations publiques.
B. Institutions patronales.
C. Caisse Générale de Retraite instituée sous la garantie de l'État.
D. Systèmes divers.

A.—Administrations Publiques.

(*a*) Pensions à charge de l'État.

C'est l'État d'abord qui doit attirer l'attention. C'est lui qui, comme employeur, entretient la plus nombreuse armée de fonctionnaires.

d'employés, d'ouvriers. C'est lui qui, en créant des organismes de prévoyance sans souci des règles scientifiques, a entraîné dans cette voie périlleuse les administrations provinciales et communales, les établissements de bienfaisance ; et c'est par conséquent sur lui que pèse surtout la responsabilité d'une situation dont les pouvoirs publics se préoccupent chaque jour davantage.

Les pensions civiles et ecclésiastiques sont régies, en Belgique, par la loi du 4 juillet 1844, modifiée par celles du 17 février 1849 et du 10 janvier 1886.

Au point de vue des principes généraux—les seuls que nous ayons à envisager—l'exposé des motifs accompagnant le projet—non adopté par les Chambres—de loi générale sur les pensions déposé à la Chambre des Représentants dans la séance du 10 février 1838 est intéressant à consulter.

Après avoir affirmé qu' " il est juste que, dans l'âge des infirmités, " la patrie vienne au secours de celui qui lui a consacré ses talents et " ses forces " il demande à la Législature si l'État n'a aucun devoir à remplir envers la veuve, les orphelins et, limitant ce devoir à une tutelle prévoyante, il pose en principe que " l'Administration doit astreindre ses " agents aux sacrifices nécessaires pour assurer à leurs veuves une " existence en rapport avec la position qu'ils occupent, et à leurs enfants " les bienfaits d'une éducation convenable."

La loi de 1844 consacra définitivement ces deux principes : l'obligation pour l'État de concourir à la constitution d'une pension de vieillesse pour ses agents, l'obligation pour ceux-ci de créer, au moyen d'un prélèvement sur leur traitement, la pension de survie de leur femme et de leurs enfants, doivent être considérées comme deux des clauses fondamentales du contrat de louage de services qui se noue tacitement entre l'État et ceux qu'il emploie.

Mais le droit de l'agent à une pension personnelle est subordonné à une double condition d'âge et de durée de services : abstraction faite de réductions d'âge et de durée pour certaines catégories, des cas d'invalidité prématurée et de blessures ou d'accidents professionnels, la loi exige que les magistrats, fonctionnaires ou employés, pour être admis à la pension, aient 65 années d'âge et 30 années de service.

Cette dure obligation de la permanence des services, qui de la loi de 1844 passa dans de nombreux règlements administratifs et particuliers sur les pensions de retraite, est injustifiable. Elle lie arbitrairement l'employé à l'employeur, frappant de déchéance celui qui, pour des motifs de convenance personnelle, renonce prématurément à ses fonctions, et celui qui est révoqué, quelle que soit la cause de la révocation. Ainsi entendue, la pension de vieillesse devient en quelque sorte une faveur, un acte de munificence, tandis qu'elle doit être considérée comme successivement et définitivement conquise par le travailleur : pour chaque année, pour chaque instant de travail accompli, la rémunération doit comprendre une quotité employée à la constitution de la pension, de telle sorte que celui qui, à un moment quelconque, change d'occupations ou même cesse de travailler, emporte avec lui et conserve tous les droits à la pension, acquis par ses services antérieurs. Est-il nécessaire d'ajouter que la condition d'un minimum de temps de service et d'un âge déterminé est désavantageuse pour l'État lui-même, en ce qu'elle peut l'obliger à conserver pendant un certain nombre

d'années un fonctionnaire devenu impropre au service qu'il pourrait, si cette condition n'existait pas, congédier de suite en lui octroyant la pension correspondant aux services rendus ; l'administration est ainsi liée à des employés paresseux ou incapables.

La loi de 1844 faisait peser sur le Trésor seul la charge des pensions ; mais la loi du 17 février 1849 introduisit un principe nouveau en contradiction avec le principe fondamental de la loi de 1844, en obligeant les agents de l'État à contribuer, par une retenue de 1 p.c. sur leur traitement, à " former en quelque sorte une partie du fonds destiné à " assurer leur existence quand par l'âge ou les infirmités ils deviennent " incapables de continuer l'exercice de leurs fonctions." Mais qu'on ne s'y méprenne pas ! Si le législateur modifia ainsi, dans son essence, la loi de 1844, il ne le fit point parce qu'il reconnaissait que ses agents devaient concourir à la constitution de leur pension ; le rapport de la section centrale dit nettement que " la proposition du Gouvernement ne " peut s'appuyer que sur des motifs tirés de la nécessité impérieuse " d'alléger les charges qui pèsent sur le Trésor " et c'est à ce point de vue que la disposition nouvelle fut examinée en sections. Mais n'est-il pas étonnant que l'on ait pu introduire parallèlement dans la loi la double condition d'âge et de durée de services et l'obligation pour les agents de se soumettre à une retenue sur leur traitement ?[1]

Lorsque fut présenté aux Chambres le projet de loi qui devint la loi de 1844, il existait en Belgique des caisses de retraite pour certaines catégories d'employés de l'État et quelques caisses des veuves ; les unes et les autres étaient imparfaites à ce point de vue qu'elles n'établissaient aucun lien technique entre les charges qu'elles assumaient et les recettes qu'elles encaissaient. La loi de 1844, qui les supprima, ne fit pas mieux ; et c'est l'application des règles empiriques qu'elle édicta, et qui n'ont pas été modifiées depuis cette époque, qui conduisit nos caisses de veuves et orphelins à la situation critique où toutes se trouvent aujourd-hui ; c'est à cause de ces règles que l'évaluation des charges totales de pensions qui grèvent le Trésor ne peut être entreprise et que l'on en est arrivé à assimiler les arrérages annuels des pensions en cours à des charges budgétaires, comme si les charges de pensions ne correspondaient pas à des engagements viagers dont la valeur actuelle devrait venir s'ajouter à la dette nationale.

Le législateur prescrivit, en effet, que les pensions de retraite seraient liquidées à raison, pour chaque année de service, d'un soixantième de la moyenne du traitement dont l'intéressé aura joui pendant les cinq dernières années.

En fait, aucun des éléments nécessaires au calcul de la valeur actuelle des pensions différées n'est déterminé : le montant de la pension est inconnu et l'on peut dire que l'âge d'entrée en jouissance est également indéterminé, car il arrive fréquemment que des fonctionnaires sont maintenus en fonctions après soixante-cinq ans.

À combien de millions s'élève la dette viagère qui pèse sur l'État du chef de ses engagements de pensions envers ses agents ? On ne saurait le dire, et il semble qu'on n'en ait point souci. Pourtant le fonctionnement régulier de nos institutions, le développement, le perfectionnement des conditions économiques et sociales accroissent sans cesse le nombre

[1] Cette obligation ne fut pas maintenue ; aujourd'hui le Trésor seul supporte la charge des pensions de retraite de ses agents.

des fonctions, des emplois rétribués par le Trésor public et, comme cet accroissement se produit plus rapidement que celui de la population, il en résulte que, du chef des pensions, chaque génération lègue à celle qui la suit une charge proportionnellement plus lourde que celle que lui a laissée sa devancière. Et le fardeau qui pèse sur le Trésor s'alourdit toujours, sans qu'on en puisse apprécier l'aggravation autrement que par la simple constatation d'une progression rapide des pensions en cours.

Il faut signaler cependant un premier effort tenté pour rompre avec les errements dangereux suivis jusqu'aujourd'hui. En 1892, le Gouvernement, voulant assurer à tous les cantonniers des routes de l'État une pension de vieillesse dont ils auraient la jouissance à partir de soixante-cinq ans, les affilia à la Caisse de Retraite sous la garantie de l'État et fixa les versements mensuels de 2fr. à 5fr. suivant l'importance du salaire.

Nous terminons l'examen succinct de la loi sur les pensions civiles et ecclésiastiques en signalant trois de ses articles en vertu desquels le Trésor peut servir des pensions d'invalidité après cinq ou dix années de service et doit servir une pension, quels que soient l'âge et la durée des services, à tout fonctionnaire ou employé qui, par suite de blessures reçues ou d'accidents survenus dans l'exercice ou à l'occasion de l'exercice de ses fonctions, aura été mis hors d'état de les continuer ou de les reprendre ultérieurement.

Ce qui vient d'être dit concernant les pensions civiles s'applique dans une très large mesure aux pensions militaires. Ces dernières sont réglées par la loi du 24 mai 1838, qui n'a pas subi de modification essentielle.

Comme la loi de 1844, elle ne reconnaît le droit d'être admis à la pension que pour les militaires ayant accompli un certain nombre d'années de service et atteint un âge déterminé, et frappe de déchéance ceux qui n'ont pas satisfait à cette double condition.

En fait, l'âge de la retraite est fixé pour les divers grades ; mais la pension dépendant du grade et variant même, pour chaque grade, avec le nombre total d'années de service, l'évaluation technique des charges correspondant aux pensions différées est impraticable.

Plusieurs caisses spéciales de pensions, créées et réglementées par une loi, ont la charge de rentes de vieillesse qu'elles doivent liquider au moyen de leurs ressources propres. Nous dirons quelques mots des deux plus importantes : la Caisse de Retraite et de Secours des Ouvriers de l'Administration des Chemins de Fer, Postes et Télégraphes, et la Caisse Centrale des Secrétaires Communaux.

Ces institutions font tout à la fois l'office de caisses de retraite, de caisses d'invalidité, de caisses de veuves et orphelins, et il suffit d'énumérer succinctement, pour chacune d'elles, d'une part les ressources, d'autre part les charges, pour prouver l'absence de lien technique entre les unes et les autres.

I. *Caisse de Retraite et de Secours des Ouvriers des Chemins de Fer, Postes et Télégraphes.*

Ressources.—1°. Retenue de 3 p.c. sur les salaires journaliers de fr. 2.40 et au-dessous;

Retenue de 4 p.c. sur les salaires de plus de fr. 2.40.

2°. Montant des retenues:

a. Pour toute mesure disiplinaire, à concurrence d'un mois au plus;

b. Pour tout congé, à concurrence d'un mois au plus;

c. Pour toute absence quelconque, à concurrence de la moitié du salaire, pendant un mois au plus, lorsque l'agent n'a pas dû être remplacé;

3°. Subsides du Gouvernement;

4°. Donations, legs et dons des particuliers;

5°. Produits divers;

6°. Intérêts des capitaux placés au nom de la caisse.

Charges. A. *Pensions des associés.*—Ont seuls droit d'être admis à la pension:—

1°. Les associés invalides qui ont participé à la caisse pendant dix ans révolus;

2°. Les associés dont l'invalidité a pour cause un accident survenu dans l'exécution ou à l'occasion de l'exécution de leur travail;

3°. Les associés âgés de 60 ans, mis à la retraite parce que, sans être atteints d'infirmités permanentes, ils n'ont plus la validité nécessaire pour exécuter leur service avec vigilance.

Les pensions des associés sont liquidées comme suit: 20 p.c. du salaire moyen des trois dernières années, pour les dix premières années de contribution admissible, $1\frac{1}{2}$ p.c. pour chaque année de contribution au-delà de dix. Les pensions des associés ne peuvent cependant pas excéder 50 p.c. du salaire moyen des trois dernières années, ni dépasser 2,500 francs.

B. *Pensions des veuves, pensions des orphelins et ascendants.*—Elles sont soumises à des règles compliquées et empiriques qu'il nous semble inutile de reproduire.

II.—*Caisse Centrale de Prévoyance des Secrétaires Communaux.*

Ressources.—1°. Retenue annuelle de 3 p.c. à opérer sur les traitements des secrétaires participants;

2°. Retenue du premier mois de traitement du participant qui est nouvellement nommé dans une commune, ainsi que du premier mois de toute augmentation portant sur un traitement supérieur à 200 francs ou l'élevant au-dessus de cette somme;

3°. Subside des communes, qui n'interviennent actuellement dans aucune autre caisse de prévoyance, égal à 3 p.c. du traitement que chacune d'elle alloue pour l'emploi de secrétaire, à porter annuellement à leurs budgets;

4°. Subside annuel de l'État égal à 2 p. c. de la somme totale des

traitements des secrétaires du royaume participant à la caisse centrale;

5°. Subside de toutes les provinces égal à 1 p. c. des traitements de leurs secrétaires participant à la caisse centrale, à porter annuellement à leurs budgets.

Charges. A. *Pour les participants.*—Les pensions sont liquidées à raison, pour chaque année de contribution à la caisse, d'un soixantième de la moyenne du traitement qui a été assujetti à la retenue annuelle pendant les cinq dernières années. Tout traitement inférieur à 200 francs est porté à cette somme dans la moyenne.

B. *Pour les veuves et les orphelins.*—La pension de la veuve varie, suivant les cas, de la moitié à la totalité de la pension à laquelle le mari aurait eu droit au moment de son décès.

Celle des orphelins varie, suivant le nombre de ceux-ci, du tiers à la totalité de la pension du père.

La Caisse des Secrétaires communaux fut, dans ces dernières années, l'objet d'études consciencieuses: l'actif de la caisse s'augmentant d'année en année, les affiliés demandèrent l'augmentation du taux des pensions avec une telle insistance que le Gouvernement institua, en 1892, une Commission présidée par Mr. H. Adan, et dont le regretté Mahillon fit partie. Elle fut notamment chargée d'établir la situation financière de cette caisse. Après de longs travaux (1892 à 1895), la Commission conclut à l'impossibilité d'établir exactement l'importance du passif de l'organisme.

De quelque côté qu'on tourne les regards, on est forcé de constater que les institutions créées par l'État manquent de fondement scientifique et que l'impossibilité d'établir périodiquement des bilans techniques accusant leur situation financière réelle les laisse exposées à de redoutables éventualités.

(*b*) Pensions à charge des Provinces, des Communes et des Établissements Publics.

La loi de 1844 servit naturellement de modèle aux communes et aux établissements publics qui en dépendent, et les règlements en vigueur depuis longtemps dans de nombreuses villes importantes du pays ont adopté, sans modifications essentielles, les principes généraux de la loi sur les pensions civiles.

Toutefois la progression rapide et importante des charges annuelles provenant des pensions en cours sembla menaçante pour l'équilibre budgétaire de certaines villes et les vices du système furent vivement critiqués: on fit observer avec raison que le droit à la pension s'acquiert au fur et à mesure de l'accomplissement des services et qu'il était donc conforme à l'équité de constituer progressivement le fonds de chaque pension individuelle, au lieu d'en reporter la charge sur les seuls exercices budgétaires postérieurs à la mise à la retraite. À un autre point de vue, on ne manqua pas de signaler que presque toutes ces caisses ne possèdent qu'un nombre restreint d'affiliés, et que, par conséquent, elles sont livrées au hasard. Comme elles ne satisfont pas à la loi des grands nombres, l'évaluation technique de leurs charges, même

si le lien qui doit exister entre les ressources et les engagements était rationnellement déterminé, n'aurait pas grande signification.

C'est alors que se fit jour une proposition vraiment originale, dont la réalisation, possible dans un petit pays comme la Belgique, eût fédéré les villes et communes en une vaste association intercommunale d'assurances ayant pour objet de servir des pensions de retraite aux fonctionnaires et employés et des pensions de survie aux veuves et orphelins. Cet organisme aurait été créé conformément aux exigences de la science actuarielle. L'idée était séduisante et ceux qui ont connu Mahillon ne seront pas étonnés d'apprendre qu'elle fut vivement défendue par lui. Peu ne s'en fallut qu'elle ne fût réalisée, et cette solution qui aurait permis l'établissement périodique d'un bilan technique pouvant donner lieu à une répartition de bénéfices au prorata des sommes versées par les communes, aurait en outre présenté l'avantage de ne pas occasionner d'aggravation notable de charges pour les budgets successifs au cours de la période de transition pendant laquelle il faudrait continuer à servir les pensions en cours, tout en effectuant les versements exigés par la mise en pratique du système nouveau ; il aurait suffi que l'institution centrale d'assurances débitât les communes, les provinces, de tout ou partie de ces versements, qui n'auraient été réellement effectués, augmentés des intérêts à un taux déterminé, qu'au fur et à mesure de l'extinction des pensions en cours.

Mais on se demanda si l'existence d'un organisme fondé sur des bases techniques et jouissant de la garantie de l'État ne rendait pas inutile la création d'une caisse de pensions de vieillesse pour les employés des provinces et des communes, et l'affiliation de ces agents à la Caisse Générale de Retraite fut bientôt considérée comme la meilleure solution rationnelle de la question des pensions de retraite.

Toutefois, on y faisait une objection. La loi de 1865 qui institua la Caisse Générale de Retraite fixe à 1,200 francs le maximum des rentes qui peuvent être accumulées sur une même tête. C'est suffisant, disait-on, par rapport à des traitements moyens, c'est peu pour des fonctionnaires ayant joui de traitements importants.

Mahillon avait rencontré l'objection quand il élabora le réglement de la Caisse de Retraite des employés de la Caisse Générale d'Épargne et de Retraite sous la garantie de l'État et il s'était demandé s'il était conforme à la prévoyance bien comprise de faire reposer sur la tête du fonctionnaire retraité une pension importante qui s'éteint avec lui.

Après avoir mis en parallèle deux systèmes opposés, celui de la *rente viagère unique* et celui de la *constitution de capitaux de patrimoine*, et démontré que l'un et l'autre offrent des avantages et des inconvénients, il arrivait à cette conclusion qu'il valait mieux limiter la pension à la quotité nécessaire pour la satisfaction des besoins essentiels et affecter la partie restante des versements à la constitution progressive d'un patrimoine dont l'employé aurait la disposition au moment de sa mise à la retraite.

C'est ce système mixte qui fut adopté, dès 1889, pour le personnel de la Caisse Générale d'Épargne et de Retraite.

Bientôt des administrations publiques s'en emparèrent : à partir de 1893, le Conseil provincial du Hainaut encouragea par des subsides l'affiliation à la Caisse de Retraite des employés communaux de la province, et le règlement voté ne fit que reproduire les dispositions prin-

cipales de celui de la Caisse Générale.[1] L'employé subit une retenue de 4 p. c. sur son traitement et la commune lui alloue une subvention de même importance. Les retenues sont versées à la Caisse de Retraite à capital réservé, les subventions à capital abandonné. A la fin de l'année, la province verse à chaque compte individuel, à capital abandonné, une subvention de 1 p.c. Quand le maximum de rente (1,200 francs ou le $\frac{2}{3}$ du dernier traitement) est atteint, les retenues et les subventions sont employées à former successivement le patrimoine.

D'autres administrations ont suivi cet exemple et bien que la résistance à la pénétration des doctrines de la prévoyance scientifiquement organisée soit bien grande encore, même dans les milieux qu'on croirait les mieux préparés à les recevoir, il est probable que c'est dans cette forme que se résoudra lentement la question de la pension de vieillesse des fonctionnaires et employés des administrations publiques. Il est certain que l'abandon des errements condamnés par la science et l'adoption des procédés d'essence technique seraient plus rapides si la Caisse Générale de Retraite, à laquelle le Législateur a annexé en 1894 une Caisse d'Assurances sur la vie, offrait également une solution rationnelle du problème des pensions de veuves et d'orphelins en pratiquant les combinaisons de la rente de survie.

B.—Institutions Patronales.

Quoique peu nombreuses, les institutions patronales de pensions de vieillesse existant en Belgique appartiennent à des types bien différents. Plusieurs offrent le grave inconvénient que nous avons relevé à la charge des institutions créées par les Administrations publiques : absence de relations sûres entre les recettes et les dépenses, fixation arbitraire des pensions et des versements. Une autre cause d'insécurité gît dans la confusion des fonds appartenant à ces caisses de pensions avec l'encaisse générale de l'établissement dont elles dépendent, de telle sorte que la déconfiture de celui-ci engloutirait l'avoir de l'organisme de prévoyance, jetterait dans la misère les vieux pensionnés, sèmerait le découragement, le mécontentement surtout parmi ceux qui voient approcher l'heure du repos. Et ce n'est pas moins vrai—l'expérience l'a démontré—lorsque la fortune de l'institution de retraite est uniquement due aux subventions patronales que lorsqu'un règlement fixant les conditions d'admission au travail oblige les travailleurs à contribuer à l'alimentation du fonds des pensions.

En tête des institutions patronales se trouvent les *Caisses communes de prévoyance en faveur des ouvriers mineurs*. Elles sont vieilles de plus d'un demi siècle, mais c'est la loi du 28 mars 1868 qui les reconnut comme personnalités juridiques.

[1] Le règlement de la Caisse de Retraite du personnel de la Caisse Générale d'Épargne et de Retraite vient d'être modifié sur les bases suivantes :

La subvention est portée à 6 pour cent. et la retenue à 4 pour cent. des traitements ; sur le total de 10 pour cent. est d'abord prélevée la somme nécessaire pour former la prime constante d'une assurance vie-entière de 5,000 francs contractée au profit de la femme de l'employé ; le surplus est versé à la Caisse de Retraite, à capital abandonné, pour acquisition de rentes prenant cours à 65 ans ; quand le maximum légal de 1,200 francs de rente est atteint, ce surplus est affecté à la constitution d'un patrimoine remis à l'employé à 65 ans.

Nul autre exemple ne démontre mieux la nécessité de subordonner le fonctionnement d'institutions de ce genre à des règles souveraines dont il suffit de prouver l'impérieuse nécessité pour les faire accepter par les intéressés eux-mêmes.

Six caisses communes furent créées, une pour chaque district minier du pays. D'après l'article premier de la loi de 1868, les Caisses de prévoyance ont pour objet d'accorder des pensions et secours " aux " ouvriers employés à l'exploitation des mines, des minières, des " carrières et usines, aux veuves de ces ouvriers et à leurs familles."

Au début, les pensions ne furent, en général, octroyées qu'aux ouvriers devenus incapables de travailler par suite d'accidents professionnels, parfois à de vieux ouvriers devenus infirmes par l'exercice de leur profession et ayant été attachés pendant un certain nombre d'années à des exploitations associées à la caisse commune. La pension de vieillesse était l'exception.

Pour cinq des caisses de prévoyance, les ressources provenaient principalement d'une retenue sur les salaires combinée avec une subvention des exploitants.[1] Seule la Caisse de Charleroi mit, dès le début, l'alimentation du fonds de pensions et de secours à charge des seuls exploitants. Nous rappellerons que la relation entre les recettes et les dépenses ne fut établie qu'empiriquement et qu'une évaluation des charges est donc impossible. Comment s'étonner que les Commissions administratives aient insensiblement dévié des principes fondamentaux de l'institution, qu'elles aient élargi le cercle d'action des caisses au risque de les mettre en péril ?

Aujourd'hui les Caisses communes accordent tout à la fois des pensions ou des secours à la suite d'accidents ou d'infirmités et des pensions de vieillesse ; pour l'une d'entre elles, tandis que la charge annuelle provenant des pensions octroyées aux ouvriers infirmes est restée presque constante pendant une période de 17 années, la dépense due aux pensions de vieillesse a quadruplé pendant le même temps.

Dans un rapport adressé au roi en 1881, le Ministre des Travaux Publics signala la situation financière peu brillante des caisses de prévoyance et la difficulté de maintenir l'équilibre entre les charges et les ressources. La commission administrative de la caisse de la province de Liége ayant proposé une augmentation—évidemment arbitraire, empirique—du taux des cotisations, le Ministre demanda au roi de l'approuver. Puis il s'associa à une résolution prise par la commission administrative et tendant à la suppression de toute retenue sur le salaire, les patrons seuls devant à l'avenir supporter le fardeau également supporté jusqu'alors par les ouvriers et les exploitants. La justification de cette thèse est curieuse : " Les caisses de " prévoyance ne sont pas autre chose que des associations formées entre " patrons dans un but philanthropique. Elles n'établissent pour les " ouvriers aucun lien social, ni entre eux, ni d'eux avec les patrons. Ce " n'est donc qu'aux patrons seuls qu'elles doivent demander des " ressources." S'il en est ainsi, pourquoi ne pas enlever aux caisses communes leur belle appellation d'organismes de prévoyance et ne pas les ranger tout simplement dans la catégorie des institutions de bienfaisance ? Et si l'on peut soutenir qu'une caisse de pensions et de

[1] Les Caisses communes reçoivent également des subsides de l'État et des provinces.

secours contre les accidents peut recevoir ses cotisations des exploitants seuls, ira-t-on jusqu'à prétendre qu'une institution qui sert des pensions de retraite ne doit pas exiger des ouvriers un effort personnel, une participation à la constitution du fonds des pensions? Ce serait renoncer à l'un des grands résultats espérés par tous ceux qui s'intéressent au sort des travailleurs, le relèvement de l'ouvrier à ses propres yeux.

Il est fâcheux, étant donné le caractère complexe des caisses communes de prévoyance, que le principe de la non-intervention de l'ouvrier ait été admis. Le mal étant fait, il n'y a qu'un moyen de le réparer. C'est de dédoubler ces organismes, de leur conserver exclusivement leur caractère principal d'institution de prévoyance contre les accidents du travail et de les instituer sur de nouvelles bases, que l'actuaire aura pour mission d'établir; puis, de rattacher le service des pensions de retraite à la Caisse Générale de Retraite.

La seconde partie de ce programme de réforme fut bien près d'être réalisée en 1891 par l'affiliation des 100,000 ouvriers mineurs belges à la Caisse de Retraite; il est permis de croire que cette solution ne tardera pas à s'imposer.

Des sociétés industrielles importantes ont organisé des caisses de prévoyance assurant leurs employés ou leurs ouvriers contre les suites des infirmités et de la vieillesse, et il est intéressant de constater que certains efforts ont été faits pour instituer ces organismes sur des bases durables; on a posé en principe que le capital des pensions devait être constitué au moment où elles prennent naissance afin d'éviter de rejeter sur l'avenir des charges incombant au passé. Mais on est généralement tombé dans une erreur commune à tous ceux qui n'ont qu'une connaissance rudimentaire des procédés de la science actuarielle: pour déterminer la valeur actuelle d'une pension en cours, on cherche la vie probable du pensionné, on la réduit pour tenir compte de ce que l'institution ne pensionne que des individus reconnus invalides; puis on multiplie l'allocation journalière par le nombre de jours de la vie probable ainsi calculée et l'on escompte le produit à un taux fixé!

Mieux vaut ne rien dire de la méthode purement empirique employée pour déterminer en fonction du salaire la contribution affectée à l'alimentation du fonds des pensions, ni du mode de calcul du montant des pensions.

Généralement ces caisses de pensions n'ont comme ressources qu'une subvention patronale, sans intervention pécuniaire de ceux en faveur desquels elles ont été instituées. Nous avons déja dit ce que nous pensons de ce système qui ne poursuit qu'un but matériel et tient pour rien l'amélioration morale qui doit généralement résulter de la succession des efforts individuels du travailleur lui-même. Ajoutons que la pension de vieillesse n'est octroyée qu'à ceux qui ont accompli un certain nombre d'années de services ininterrompus.

Certains établissements financiers ont institué des caisses se rapprochant plus ou moins des caisses de patrimoine, et alimentées par des retenues sur les traitements combinées avec une subvention, généralement de même importance, allouée par l'établissement.

Le prélèvement d'une fraction du traitement n'empêche pas la déchéance des droits des participants par suite de démission, de révocation ou pour d'autres causes.

Les parts acquises peuvent, lors de l'ouverture des droits à la

retraite, être affectées, si l'employé le désire, à l'acquisition d'une rente viagère réversible ou non.

Nous arrivons au système qui, dans la catégorie des institutions patronales, apparaît comme étant le plus simple, le plus sûr, le moins exposé aux vicissitudes qui peuvent atteindre tous ceux qui viennent d'être rapidement esquissés. C'est celui dans lequel l'employeur se décharge du fardeau, difficile à manier, des pensions de vieillesse, en achetant tout simplement celles-ci à une institution vendeuse de rentes solidement organisée. C'est le plus répandu en Belgique et il le serait plus encore si la menace de l'assurance obligatoire n'avait pas momentanément ralenti le mouvement qui s'etait dessiné en Belgique depuis quelques années, et dont Mahillon fut un des ardents promoteurs. Dans ce système, une retenue variant de 1 à 5 p.c. sur les salaires est combinée avec une subvention patronale généralement égale à la retenue ; ces sommes sont mensuellement versées à la Caisse Générale de Retraite pour acquisition de rentes viagères dont l'entrée en jouissance est le plus souvent fixée à 60 ou 65 ans ; les retenues sont communément versées à capital réservé et la subvention à capital abandonné.

Plusieurs établissements industriels imposent l'affiliation pour les nouveaux ouvriers. Nous ne sommes point partisan de l'obligation en quelque matière que ce soit, notamment quand il s'agit de pensions de vieillesse, mais nous pensons qu'elle peut constituer une des clauses d'un contrat de travail, librement accepté, surtout si la rigueur en est tempérée par la promesse d'une intervention patronale.

Il n'est pas nécessaire de décrire tous les avantages d'un pareil système, tant pour le patron que pour ses employés et ouvriers. S'il laisse entière la liberté et la dignité de ceux-ci, il n'établit pas moins nettement la situation de l'employeur qui, de ses conseils et de ses deniers, soutient le travailleur dans le rude chemin de la prévoyance et l'encourage à pratiquer une vertu sociale dont la possession le grandira à ses propres yeux.

D'un autre côté, l'employeur peut se décharger de la conservation et de la gestion de sommes considérables et la sécurité du travailleur est aussi complète qu'elle peut l'être.

C.—Caisse Générale de Retraite instituée sous la Garantie de l'État.

Nous avons, dans ce qui précède, cité maintes fois la Caisse Générale instituée sous la garantie de l'État. Nous avons déjà dit que cet organisme est la seule création de l'État en matière d'institutions de prévoyance et d'assurance qui soit à peu près irréprochable au point de vue technique. Elle est régie par la loi du 16 mars 1865, modifiant celle du 8 mai 1850. Elle est accessible au public en général et permet d'acquérir, jusqu'à un maximum de 1,200 francs, des rentes différées dont l'entrée en jouissance peut être fixée à un des âges entiers compris entre 50 et 65 ans. Les versements peuvent être faits à capital abandonné ou à capital réservé.

Les tarifs sont calculés d'après les règles scientifiques sur les bases suivantes :

1°. Taux d' intérêt 3 p.c. ;

2°. Table de mortalité de Quetelet;

3°. Charge de 3 p.c.

La Caisse de Retraite peut effectuer ses placements de l'une des manières suivantes :

1°. Achat de fonds publics belges ou autres valeurs garanties par l'État;

2°. Achat d'obligations sur les provinces, villes ou communes de la Belgique ;

3°. Prêts hypothécaires;

4°. Achat d'obligations des sociétés belges qui, depuis cinq ans consécutifs au moins, ont fait face à tous leurs engagements au moyen de leurs ressources ordinaires.

L'organisation technique de cette institution serait entièrement conforme aux principes de la science actuarielle si le législateur ne lui avait imposé certaines charges dont il n'a pas été tenu compte dans le calcul des tarifs : le 2e alinéa de l'art. 50 de la loi du 16 mars 1865 stipule en effet que si l'affilié dont l'existence dépend de son travail est victime d'un accident professionel entraînant l'incapacité permanente, il peut jouir immédiatement des rentes qu'il a acquises depuis 5 ans au moins, sans que ces rentes puissent dépasser 360 francs; et l'article 54 de la même loi oblige la Caisse à pourvoir aux funérailles des assurés indigents décédés postérieurement à l'entrée en jouissance de leur rente.

L'histoire de la Caisse Générale de Retraite peut être divisée en trois périodes distinctes, que nous décrirons succinctement.

Première Période.—Régime de la Loi du 8 *Mai* 1850.

Le minimum des rentes à acquérir fut fixé à 24 francs ; la Caisse acceptait des versements de 5 francs et au-dessus, mais ces versements restaient improductifs d'intérêts, jusqu'au moment où des versements ultérieurs pouvaient permettre l'acquisition de la rente minimum de 24 francs ; l'entrée en jouissance des rentes ne pouvait être fixée qu'à 55, 60 ou 65 ans, et les rentes devaient être différées d'au moins dix ans; elles ne s'acquéraient qu'à capital abandonné. Le maximum des rentes fut fixé à 720 francs et le service de la Caisse confié aux receveurs des contributions.

De grands efforts furents faits pour répandre la connaissance de la nouvelle institution, mais peu d'adhésions furent recueillies, et il fut tôt reconnu que le peu de succès de la propagande très active entreprise en faveur de la Caisse était dû à des imperfections de la loi.

Dès 1856, la Commission administrative de la Caisse proposa diverses modifications essentielles, et le Gouvernement s'occupa activement des études préparatoires à la création d'une Caisse Générale d'Epargne à laquelle la Caisse de Retraite serait annexée. Ce ne fut cependant qu'en 1859 qu'un projet de loi dans ce sens fut présenté à la Chambre des Représentants, par M. Frère-Orban, Ministre des Finances; ce projet ne fut discuté qu'en 1862, et au Sénat en 1864; la loi fut promulguée seulement en 1865 (16 mars).

Dans l'entretemps, la Caisse de Retraite végéta : la propagande cessa, parce qu'on la jugeait inutile, à cause des imperfections de la loi, et le public attendait la réalisation de la promesse de dispositions meilleures.

La loi de 1865 rattacha la Caisse de Retraite à la Caisse d'Épargne;

elle ne fut cependant appliquée, en ce qui concerne la première, qu'à partir du 1er août 1868.

Deuxième Période.—Régime de la Loi du 16 *Mars* 1865 *et de l'Arrêté Royal du* 21 *Juin* 1868.

La loi de 1865 apporta à celle de 1850 des modifications profondes, en ce qui concerne la Caisse de Retraite ; les tarifs furent considérablement développés ; deux modes d'acquisition de rentes furent adoptés : à capital réservé et à capital abandonné ; le minimum des rentes fut fixé à 12 francs, et le minimum des versements à 10 francs[1] ; les sommes insuffisantes pour produire le minimum de rentes furent considérées comme dépôts d'épargne productifs d'intérêts ; l'entrée en jouissance pouvait être fixée à un des âges entiers compris entre 50 et 65 ans, et les tarifs furent calculés sur la base d'un taux de 4½ p.c.

Au début de cette seconde période, on constate quelques adhésions à la Caisse de Retraite, entre autres celles des employés et ouvriers de la Compagnie du Nord.

Le Gouvernement, par la loi du 3 juin 1870, allouait à tout milicien qui avait accompli son temps de service une somme de 150 francs, et en outre, une somme de 12 centimes par jour de présence pour toute la durée du service ordinaire et du service fait par suite du rappel en temps de paix. Ces sommes devaient être affectées à la création de rentes viagères prenant cours à 55 ans. Malheureusement, celle loi fut rapportée en 1875, et ne fut appliquée qu'en partie aux miliciens des classes de 1871 à 1874.

Lorsque la Caisse de Retraite commença à fonctionner sous le régime de la loi de 1865, celle-ci était déjà en vigueur, et la Caisse d'Épargne, qui venait de naître, fut l'objet de tous les efforts de propagande. Beaucoup de bons esprits étaient d'ailleurs convaincus de la nécessité de répandre d'abord la pratique de la prévoyance sous sa forme la plus élémentaire, et de l'inutilité des efforts qui seraient faits en vue de propager la prévoyance contre la vieillesse, si l'on n'avait pas préalablement fait l'éducation du public en matière d'épargne simple. Il en résulta que la Caisse de Retraite continua à rester dans l'ombre, et un peu plus tard, quand la cause de l'épargne fut gagnée, lorsqu'on voulut songer à faire connaître la Caisse de Retraite, on se heurta à la crainte de voir se developper des opérations de rentes viagères calculées à 4½ p.c., alors que le taux des placements sûrs était déjà voisin de 4 p.c.

Déjà en 1882, on exprima ces craintes, et dès ce moment on sembla décidé à n'entamer de propagande sérieuse en faveur de la Caisse de Retraite, que lorsqu'il serait possible d'appliquer un tarif calculé à un taux plus faible.

On peut donc dire que pendant cette seconde période, la Caisse de Retraite fut volontairement négligée, et il n'est donc pas étonnant qu'elle continua à être presque complètement ignorée.

[1] Depuis 1889, le minimum des versements a été abaissé à 1 franc ; et, depuis 1896, le minimum des rentes différées a été fixé à 1 franc.

Troisième Période.—Régime de la Loi du 16 *Mars* 1865 *et de l'Arrêté Royal du* 13 *Juillet* 1887.

L'arrêté royal du 13 juillet 1887 fixe de nouveaux tarifs établis sur la base d'un taux d'intérêt de 3 p.c., et qui furent mis en vigueur à partir du 1er janvier 1888.

À dater de ce moment, aucune raison d'ordre financier ne s'opposa plus à l'entreprise d'une vaste propagande en faveur de la Caisse de Retraite, et ce fut le point de départ d'une très remarquable extension des opérations de la Caisse de Retraite: avant 1888, le nombre de versements annuels avait rarement dépassé 3,000; voici les nombres annuels successifs de versements depuis 1888:

en 1888	4,887	en 1893	58,882
en 1889	6,832	en 1894	69,242
en 1890	18,567	en 1895	85,477
en 1891	30,970	en 1896	111,020
en 1892	45,336	en 1897	171,506

D.—Systèmes Divers.

La grande vogue des "Prévoyants de l'Avenir" en France n'a pas été sans produire des effets en Belgique; on n'ignore pas que le système de cette société consiste essentiellement dans l'accumulation d'un capital formé par les cotisations, et dans la distribution des intérêts de ce capital inaliénable entre tous les participants qui ont satisfait à un certain stage (20 ans).

Nous n'avons pas à mettre en évidence les défauts de ce système; MM. Prosper de Lafitte et Léon Marie, dans diverses publications, M. Lourties, dans son remarquable rapport au Sénat français, en ont fait bonne justice.

Cependant, nous avons vu se créer en Belgique, dans ces derniers temps, quelques associations de ce genre, et elles paraissent s'étendre, surtout dans les milieux ouvriers. La plupart, il est vrai, ont apporté certaines atténuations à la combinaison des "Prévoyants de l'Avenir"; elles ont limité les premiers dividendes; elles ont, en réalité, rendu moins brutale la spoliation que les fondateurs commettent au détriment de leurs co-sociétaires, mais elles n'en sont pas moins condamnables, bien qu'elles soient souvent organisées par des personnes honorables et de très bonne foi. Ce n'est pas sans une certaine tristesse que l'on est amené à constater que de très honnêtes gens, guidés par les plus louables sentiments, en arrivent à penser qu'il existe des combinaisons équitables permettant d'assurer 90 francs de rente viagère, quel que soit l'âge des affiliés, moyennant 15 versements annuels de 6 francs, et cela avec les seuls revenus des capitaux accumulés.

Depuis 1895, quatre projets de loi relatifs à l'assurance ouvrière contre la vieillesse et contre l'invalidité ont été déposés à la Chambre des Représentants, par MM. Defuisseaux, de Guchtenaere, de Malander et Denis.

Ces projets s'appuient sur le principe de l'obligation et s'inspirent

plutôt de considérations d'ordre sentimental que de la nécessité de plier des organisations de ce genre à l'observation de règles scientifiques. Deux d'entre eux, celui de M. Defuisseaux et celui de M. Denis, reposent sur l'idée-mère de la répartition, que leurs auteurs opposent au système de la capitalisation.

Il n'est pas sans intérêt de faire remarquer que le système de la répartition qui consiste essentiellement, comme on le sait, dans la distribution intégrale en arrérages de pensions, de la totalité des recettes annuelles, a joui pendant quelques temps d'une très grande vogue en Belgique, même parmi certains esprits très éclairés qui ont été séduits par le caractère de simplicité indéniable de ce système et par l'avantage qu'il présente de ne donner lieu à aucune préoccupation de placements. Mais, fort heureusement, cet engouement a paru s'user peu à peu par l'étude et par la réflexion. La démonstration faite par les actuaires, que l'adoption d'un régime de répartition aboutirait à des sacrifices beaucoup plus considérables puisque ce système coûte, en période normale, trois fois plus cher que le système de capitalisation, les critiques, que l'on n'a pas réfutées, présentées contre le système allemand au dernier Congrès des Accidents du Travail par les actuaires belges, ont produit l'effet qu'ils en attendaient, et l'on observe une tendance accentuée, dans les milieux intellectuels, vers le rejet de toute combinaison s'écartant des doctrines scientifiques, et en faveur du respect absolu des exigences d'ordre technique en matière d'institutions de prévoyance et d'assurance.

Une Commission extra-parlementaire a été instituée en 1895 pour l'étude des solutions à apporter à la question des pensions de retraite ouvrières.[1]

Les travaux de cette Commission ne sont pas encore terminés. Toutefois, on n'ignore pas qu'elle s'est prononcée contre le principe de l'obligation. Sans préjuger en rien de ses décisions, on peut dire qu'elle aura vraisemblablement à tenir compte d'un mouvement qui semble emporter depuis deux années une notable partie de la population ouvrière belge dans la voie de la saine prévoyance en vue de la vieillesse.

La Caisse Générale d'Épargne et de Retraite peut revendiquer une grande partie des résultats déjà obtenus : depuis 1888, par une incessante propagande, par la distribution de nombreux tracts, d'une lecture aisée, semés dans tout le pays par plus de neuf cents bureaux,[2] elle a enseigné la prévoyance sous ses diverses formes.

Ensuite est venue s'ajouter à ces efforts l'action puissante de l'intervention des pouvoirs publics s'exerçant sous forme de subsides : ce fut d'abord l'État qui, en encourageant de cette façon l'affiliation à la Caisse Générale de Retraite des membres des sociétés mutualistes par des allocations annuelles dont la dernière, pour 1897, s'est élevée à 100,000 fr., augmenta dans des proportions rapidement croissantes le nombre des ouvriers librement affiliés à la Caisse de Retraite et y effectuant des versements individuels auxquels vient s'ajouter la subvention de l'État. Puis ce furent les provinces qui, à leur tour, inscrivirent à leur

[1] Trois membres agrégés de l'Association des Actuaires Belges font partie de cette Commission.

[2] Caisse centrale à Bruxelles, succursales en province, bureaux de poste, agences de la Banque Nationale.

budget annuel des subsides ayant la même destination ; quelques communes ont déjà suivi cet exemple et il est à présumer que les établissements charitables qui en fin de compte ressentiront tôt ou tard, par une diminution de leurs charges, les bienfaisants effets de tous ces efforts combinés, interviendront également.

Les résultats obtenus méritent d'être signalés : en 1894 le nombre des affiliés nouveaux à la Caisse de Retraite était de 4,438 ; il s'éleva à 5,790 en 1895, à 10,549 en 1896, à 17,159 en 1897. Il a été de 3,121 pour le seul mois de janvier 1898. Ce n'est pourtant qu'un commencement ; car, à côté des travailleurs affiliés par leurs patrons, de ceux qu'amènent les sociétés mutualistes,[1] va venir s'inscrire progressivement la population des écoles primaires de la Belgique entière. En effet, en 1896, prit naissance dans une partie relativement pauvre du pays un mouvement dû à l'initiative d'un fonctionnaire de l'enseignement aux efforts duquel la Caisse Générale de Retraite s'empressa de s'associer. Bientôt des sociétés de retraite s'instituèrent dans les écoles, en vue de l'affiliation à la Caisse de Retraite ;[2] elles sont reconnues par le Gouvernement et obtiendront leur part des subsides des pouvoirs publics. Leur nombre va croissant de jour en jour.

Ainsi, grâce à une propagande qui ne s'est point lassée, grâce à l'intervention des pouvoirs publics se superposant aux efforts librement pratiqués en vue de la vieillesse, on voit augmenter sans cesse, d'une part, le nombre des affiliés adultes, d'autre part, le nombre des élèves des écoles, possesseurs d'un livret individuel.

Pour ces derniers qui, au sortir de l'école, pourront être recueillis par des sociétés mutualistes pratiquant l'affiliation à la Caisse de Retraite, n'est-on pas en droit de dire que, s'ils le veulent, la question de la pension de vieillesse peut être considérée comme résolue. Pour les adultes, il résulte des premières conclusions d'un travail que nous préparons pour la Commission des pensions ouvrières que, dans les conditions où s'exerce actuellement l'intervention des pouvoirs publics, dans des limites de versements individuels annuels variant de 3 à 13 francs, et sans tenir compte d'aucune subvention patronale, les ouvriers qui commenceraient à 28 ans leurs versements périodiques parviendraient encore à acquérir à 65 ans une pension de 270 francs.

Faut il, en Belgique, chercher une autre solution ? Nous ne le pensons pas. Selon nous, l'intervention des pouvoirs publics ne se justifie que lorsqu'elle vient s'adjoindre à des efforts individuels se produisant sans contrainte légale ; on les obtient aisément de ceux qui possèdent cette trinité de vertus sociales sans lesquelles il n'y a point de prévoyance possible : la sobriété, l'ordre, l'économie. Réciproquement, on peut espérer faire naître et développer ces vertus en enseignant de bonne heure la prévoyance, en l'encourageant de toutes les manières possibles. C'est dans cette voie que la Belgique paraît s'engager ; nous formons le vœu de l'y voir persévérer.

[1] Le nombre des sociétés mutualistes qui affilient leurs membres à la Caisse de Retraite croît de jour en jour. Il s'élevait à 410 au 31 decembre 1897.

[2] La loi du 9 août 1897 abaissa à 6 ans l'âge minimum d'affiliation à la Caisse de Retraite, primitivement fixé à 10 ans.

TRANSLATION.

Old Age Pensions in Belgium.

By O. LEPREUX.

THE question of old age pensions occupies to-day the attention of the greater part of those who have the care of a staff, more or less numerous, of which they employ the intelligence or the strength, whether it be for the administration of public services, or in the pursuit of private interests. It is no longer necessary to show that the worker, used up, disabled, by long years of labour, cannot be cast aside and left in misery; but that, on the contrary, he must be allowed to enjoy at least a minimum of comfort sufficient to assure, for the last years of his life, dignity in retirement crowning the dignity of toil. But if it is generally recognized that a public department or a private employer must, in addition to the immediate and adequate remuneration for services rendered, give to those employed a supplement of wages or salary to supply or to complete an old age pension, we are far from being in agreement as to how that pension should be provided. If we examine the rules which control the different systems of old age pensions in Belgium, we are quickly led to recognize and to deplore that in this department of the domain of thrift, as in many others, no account is taken of technical requirements. Alone, the Caisse Générale de Retraite, under the guarantee of the State, instituted by the laws of 8 May 1850, and 6 March 1865, is free from such reproach.

We think it will be useful to study successively, in the following order, the different systems in force, or proposed, in Belgium:

A. Public Departments.
B. Employers' Funds.
C. Caisse Générale de Retraite, under the guarantee of the State.
D. Diverse systems.

A. PUBLIC DEPARTMENTS.

(*a*) Pensions at the cost of the State.

It is the State which must first receive our attention. It is the State which, as employer, engages the services of the largest army of functionaries, of clerks, of workmen. It is the State which, in founding thrift organizations without thought of scientific laws, has led into this perilous course Provincial and Communal administrations, and benevolent societies; and it is, therefore, on the State that lies principally the responsibility of a position which is receiving day by day more attention from public bodies.

Civil and ecclesiastical pensions are regulated in Belgium by the law of 4 July 1844, amended by those of 17 February 1849, and 10 January 1886.

From the point of view of general principles—which alone we are called upon to consider—the Parliamentary Report accompanying the draft Bill on pensions, which was not adopted by Parliament, submitted to the House of Representatives at its meeting of 10 February 1838, is very interesting to study.

After having affirmed that "it is right that in the time of "weakness, the country should come to the help of him who has "devoted to it his talents and his strength", it is asked of the Legislature whether the State has no duty to perform towards the widow and the orphans; and, limiting this duty to a foreseeing guardianship, it lays down the principle that "a public department "must compel those in its employ to make the sacrifices necessary to "assure to their widows support, in proportion to the positions they "hold, and to their children the advantages of suitable education."

The law of 1844 affirmed definitely these two principles, namely: the obligation on the State to assist in providing an old age pension for those in its employ, and the obligation laid on these to create by means of a deduction from their salaries a survivorship pension for their wives and children; and these must be considered as two of the fundamental clauses of the contract engaging their services, tacitly entered into between the State and those employed by it.

But the right of the employed to a personal pension has been subjected to a double condition, that of age and length of service. Leaving out of account the reduction of age and of length of service for certain classes, and the case of premature breakdown and of wounds or accidents incurred in the performance of duty, the law requires that magistrates, functionaries, or clerks, to be entitled to claim the pension, must be 65 years of age, and must have served 30 years.

This hard obligation of permanence of services, which, from the law of 1844, passed into numerous administrative and special rules regarding retiring pensions, is unjustifiable. It binds arbitrarily the employed to the employer, excluding him who for reasons of personal convenience gives up prematurely his employment, and him who is discharged, whatever may be the cause of his dismissal.

Thus viewed, the old age pension becomes in a way a favour, an act of benevolence; while it ought to be considered as being step by step and definitely acquired by the worker: for each year, for each moment of work accomplished, the remuneration should include a proportion set against the provision of the pension, so that he, at whatever moment he changes his occupation, or even gives up work, should carry with him and preserve all his rights to the pension acquired by his previous services. Is it necessary to add that the condition of a minimum term of service, and of a fixed age, is disadvantageous to the State itself, in that it compels it to retain, during a certain number of years, a functionary who has become unequal to his work, and who could be, if this condition did not exist, retired on his being given a pension corresponding to the services he had rendered? The Administration is thus bound to servants who may be idle or incapable.

The law of 1844 imposed on the Treasury alone the cost of pensions; but the law of 17 February 1849 introduced a new principle, in entire contradiction to the fundamental principle of the law of 1844, in obliging the servants of the State to contribute by a deduction of 1 per cent from their salaries towards "providing in a "manner a part of the funds intended to secure their subsistence "at a time when by age or by infirmities they may become incapable "of continuing and carrying out their duties." But we must not make a mistake. If the Legislature thus modified in its essence the law of 1844, it did not do so because it recognized that their servants should assist in providing their pensions. The statement of the central paragraph says frankly that "The proposal of the "Government can only stand upon the reasons arising from "imperative necessity of lightening the charges which press upon the "Treasury," and it was from this point of view that the new proposal was examined, paragraph by paragraph. But is it not surprising that they should have introduced simultaneously into the law the double condition of age and length of service and the obligation on the employed to submit to a deduction from their salaries ?*

When the Bill was presented to Parliament, which became the law of 1844, there existed, in Belgium, Pension Funds for certain categories of those employed by the State, and a few Widows' Funds. Each one of these was imperfect in that it had not established any technical relationship between the liabilities which it assumed and the receipts. The law of 1844, which repealed it, was no better; and it is the application of the empirical rules it enacted, and which have not since been modified, which has led our Funds for widows and orphans to the critical condition in which they all stand to-day. It is because of these rules that a valuation of the total liability under the pensions which press upon the Treasury cannot be undertaken, and that it has become the practice to assimilate the annual payments for pensions in force to charges in the Budget, as if these annual payments for pensions did not correspond to contracts for life annuities, of which the present value should be added to the National Debt.

The Legislature prescribed, in fact, that the retiring pensions should be liquidated year by year, at the rate, for each year of service, of one-sixtieth of the average salary which the servant had received during the last five years of his service.

In fact, not one of the elements necessary for the calculation of the value of deferred pensions is determined. The amount of pension is unknown; and we may add that the age at which the pension will be entered upon is likewise unknown, because it frequently happens that functionaries are kept at their posts after the age of 65.

To how many millions does the debt amount which arises from these life annuities at the cost of the State, accruing from its undertaking to give pensions to its servants ? It is impossible to say; and it seems that no one has any thought on the subject. Nevertheless, the normal progress of our institutions, the development, the perfecting of the economic and social conditions, increase without cessation the number of posts, of situations paid for by the Public Treasury; and, as this growth takes place more rapidly than that of the population,

* This obligation was not maintained. To-day the Treasury alone bears the cost of the retiring pensions of its servants.

it follows that, under the head of pensions, each generation bequeaths, to the one that follows it, a charge proportionally heavier than that which was left it by the generation preceding; and the weight which presses upon the Treasury constantly increases, without our being able to measure it, otherwise than by a simple comparison of the rapid progression of pensions in force.

We must, however, call attention to a first effort made to break with the dangerous errors which have hitherto been followed. In 1892, Government, wishing to secure to all the labourers on the roads maintained by the State an old age pension, to be entered upon at 65 years of age, affiliated them to the Caisse de Retraite under the guarantee of the State, and fixed a monthly contribution at from 2 francs to 5 francs, according to the amount of wages. We shall finish our brief analysis of the law on this subject of civil and ecclesiastical pensions by calling attention to three of its rules, in virtue of which the Treasury can grant an invalid pension after from five to ten years of service, and must grant a pension, whatever may be the age or the term of service, to every functionary or clerk who, on account of wounds or accidents incurred in the exercise, or on account of the exercise of his functions, shall have been rendered unable to continue them or to resume them later on.

What has been said of civil pensions is applicable, in a large degree, to military pensions. These last are regulated by the law of 24 May 1838, which has not been in any essential matter modified. Similarly to the law of 1844, it does not recognize the right to a pension except for military men having completed a certain number of years of service, and having attained a fixed age; and it excludes those who have not satisfied this double condition. In fact, the age of retirement is fixed for the different grades; but, the pension depending on the grade and varying even for each grade with the total number of years of service, the technical valuation of the liability corresponding to the deferred pensions is impossible.

Several special Pension Funds, created and controlled by law, have the care of old age pensions which they must provide out of their own resources. We shall say a few words regarding the two most important of these—the Pension Fund and Friendly Society of the Staff of the State Railways, Post Office and Telegraphs, and the Central Fund of the Communal Secretaries. These institutions include, together, Pension Funds, Sickness Funds, and Widows' and Orphans' Funds, and it will suffice to enumerate succinctly for each of them, on the one hand their resources, on the other hand their liabilities, in order to prove the absence of any technical relation between the two sides of the account.

I.—*Pension Funds and Friendly Societies for the Employees of Railway Companies and the Post and Telegraph Offices.*

Resources.—(1.) A deduction of 3 per-cent from the daily wages of Frs. 2.40 and less; a deduction of 4 per-cent on the wages exceeding Frs. 2.40.

(2.) The amount of the deductions:

(*a*) For all disciplinary measures, to the amount of one month at most.

(*b*) For each dismissal, the amount of one month at most.

(*c*) For every absence, to the amount of half the wages during at most one month, when it has not been necessary to replace the clerk.

(3.) Subsidies of the Government.
(4.) Donations, legacies, and special gifts.
(5.) Sundry items.
(6.) Interest on capital invested in the name of the Fund.

Liabilities.—(*a*) Pensions of members. Only those are entitled to pension who (1) are invalided and have contributed to the Fund for 10 full years; (2) whose incapacity is due to an accident sustained in the execution, or on account of the execution, of their duty; (3) those who are 60 years of age and retired because, without being permanently infirm, they have not got the necessary health to execute their work with efficiency.

The pensions of members are calculated as follows: Twenty per-cent of the average wages in the last three years for the first ten years of contribution, and one-and-a-half per-cent for each year of contribution above ten. The pension of members cannot exceed fifty per-cent of the average salary of the last three years, nor surpass 2,500 francs.

(*b*) Pensions of widows, and pensions of orphans and progenitors. These are subject to complicated and empirical rules, which it is not necessary to recapitulate.

II.—*Central Provident Fund of Communal Secretaries.*

Resources.—(1.) An annual deduction of 3 per-cent from the salaries of secretaries who are members.

(2.) The retention of the first month's salary of the member who is newly appointed to a Commune, as also the first month of every increase in salary of over 200 francs or which is thereby raised above that sum.

(3.) Subsidies from the Communes, which actually subscribed to no other Provident Fund, equal to 3 per-cent of the salary which each one of them allows for the service of a secretary, to be carried into their annual Budgets.

(4.) An annual subsidy by the State equal to 2 per-cent of the total salaries of the secretaries in the kingdom who are members of the Central Fund.

(5.) A subsidy from all the Provinces equal to 1 per-cent of the salaries of their secretaries who are members of the Central Fund, to be carried annually into their Budget.

Liabilities.—(*a*) For the members.

The pensions are calculated in the following manner: for each year of contribution to the Fund, one-sixtieth of the average salary which has been subject to the annual deduction during the last five years. All salaries of less than 200 francs are entered at that figure in the average.

(*b*) For widows and orphans.

The pension of the widow varies according to circumstances, from the half, to the whole, of the pension to which the husband would have been entitled at the date of his death.

That of the orphans varies according to their number, from one-third, to the whole, of the pension of the father.

The Fund of the Communal Secretaries was within the past few years the subject of careful examination. The assets of the Fund mounting up from year to year, the members demanded an increase in the rate of their pensions, with so great persistence that the Government appointed, in 1892, a commission, presided over by M. H. Adan, and of which the regretted M. Mahillon was a member. That commission was specially directed to ascertain the financial position of the Fund. After lengthy labours (1892 to 1895), the commission came to the conclusion that it was impossible to value exactly the amount of the liabilities of the institution.

In whatever direction we turn our eyes, we are forced to recognize that the institutions established by the State have no scientific basis; and that, as it is impossible to prepare periodical valuation balance sheets, showing their real financial position, the Funds are exposed to very serious possibilities.

(*b*) Pensions at the cost of the Provinces, of the Communes, and of Public Departments.

The law of 1844 naturally served as a model to the Communes and to the Public Departments depending upon them, and the rules long since in force in the principal towns of the country, have embodied without essential modifications the general principles of the law of civil pensions.

Nevertheless, rapid and substantial increases in the annual charges arising from current pensions appeared threatening to the equilibrium of the finances of certain towns, and the shortcomings of the system were vigorously criticized. It was pointed out, with reason, that the right to a pension grew according to length of service, and that it was, therefore, equitable to provide progressively accumulations for each individual pension, instead of carrying the instalments of the pension into the annual accounts subsequent to the retirement of the official. From another point of view, it was also pointed out that almost all these Funds had enrolled only a small number of members, and that therefore they were subject to fluctuations. As they were not subject to the law of average prevailing amongst a large number, the technical valuation of their liabilities, even if the balance which should exist between these and their resources should be properly adjusted, would not have any great meaning. It was then that there was brought forward a truly original proposal, the realization of which, possible in a small country like Belgium, would have federated the towns and the Communes into a great inter-communal assurance association, having for object to provide retiring pensions for the officials and clerks, and survivorship pensions for the widows and children. This institution would have been formed according to the requirements of actuarial science. The idea was seductive, and those who have known

M. Mahillon will not be surprised to learn that it was vigorously supported by him. The realization of the scheme was nearly accomplished, and this solution which would have permitted of the preparation of a periodical valuation balance sheet, rendering possible a division of surplus in proportion to the sums paid in by the Communes, would have besides had the advantage of not creating a material increase of the charges in the successive Budgets during the period of transition during which it would have been necessary to continue to pay the current pensions at the same time that payments would have been required to be made on the practical establishment of the new system. It would have been sufficient that the central insurance institution should have debited the Communes and the Provinces with the whole or with part of these payments, which would not have been really made, increasing them with interest at a fixed rate, only as the current pensions ran off.

But it was asked whether the existence of an organization, based on technical lines, and enjoying the guarantee of the State, would not render unnecessary the formation of an old age Pension Fund for the employees of the Provinces and the Communes; and the affiliation of these employees to the Caisse Générale de Retraite was soon found to be a better and more rational solution of the question of retiring pensions. Yet there was one objection made to this plan. The law of 1865, which instituted the Caisse Générale de Retraite, fixed at 1,200 francs the maximum of the annuity which could be built up for any one life. This is sufficient, it was said, in respect of moderate salaries; but it is very little for the officials who draw substantial salaries. M. Mahillon had considered this objection when he elaborated the rules of the Pension Fund of the employees of the Caisse Générale d'Epargne et de Retraite under the guarantee of the State; and he had asked himself if it was in conformity with thrift as properly understood to cause to depend on the life of a retired functionary a substantial pension which ceased at his death.

After having placed side by side the two conflicting systems, that of a life annuity alone, and that of the accumulation of capital which could be devised, and having shown that each of these presents advantages and disadvantages, he arrived at the conclusion that it was better to limit the pension to the amount necessary to actual needs, and to apply the balance of the payments to a progressive building-up of a capital sum which the employee would have at his disposal on his retirement. It is this combined system that has been in force since 1889 for the staff of the Caisse Générale d'Epargne et de Retraite. Soon some of the public departments adopted it. Starting from 1893, the Provincial Council of Hainaut encouraged by subsidies the affiliation of the communal employees of the province to the Caisse de Retraite, and the rules adopted reproduced the principal arrangements of the Caisse Générale.*

* The rules of the Pension Fund of the staff of the Caisse Générale d'Epargne et de Retraite have recently been modified in the following particulars: The subvention is raised to 6 per-cent, and deductions from the salaries to 4 per cent. From the total of 10 per-cent is first set aside the sum necessary to provide a uniform premium for a whole-life assurance of 5,000 francs taken out for the benefit of the wife of the employee. The balance is paid into the Pension Fund as a contribution, without return, for securing an annuity to be entered upon at 65 years of age. When the legal maximum of 1,200 francs of annuity is reached, the surplus is applied to provide a capital sum to be handed to the employee at 65 years of age.

The employee is subject to a deduction of 4 per-cent of his salary, and the Commune allows him a subvention of the same amount. The deductions are paid into the Pension Fund as a contribution, with return, and the subvention as one, without return. At the end of each year the Province pays into the account of each individual, as a contribution without return, a subvention of 1 per-cent. When the maximum annuity (1,200 francs, or two-thirds of the last year's salary) is reached, the deduction and the subvention are employed to build up a capital sum.

Other public bodies have followed this example; and, although the resistance to the application of the doctrines of thrift, scientifically considered, is still very great, even in quarters which one would have thought most prepared to receive them, it is probable that it is in this direction that will slowly be solved the question of old age pensions for officials and clerks in the public employ. It is certain that the abandonment of the errors condemned by science, and the adoption of correct technical processes, would be more rapid if the Caisse Générale de Retraite, to which the Legislature added, in 1894, an assurance department, could also provide a rational solution of the problem of pensions to widows and orphans by including an arrangement of survivorship annuities.

B. Employers' Institutions.

Although there are few of them, the employers' institutions for old age pensions in Belgium belong to various very different types. Several present the grave inconvenience which we have laid at the charge of the institutions founded by public bodies, namely, the absence of suitable connection between the receipts and the expenses, and the fixing arbitrarily of the pension and of the contributions. Another source of insecurity arises from the mixing of the moneys pertaining to these Pension Funds with the general assets of the establishments to which they belong, in such a way that a failure of the latter would swallow up all the property of the thrift institution, would reduce to misery the aged pensioners, would disseminate discouragement and discontent, especially among those who had seen the hour of rest approaching. And this is no less true, experience has demonstrated it, whether the moneys of the Pension Fund are due solely to the subventions of the employers, or whether there is a rule making it a condition of employment that the worker should contribute towards the pension.

At the head of the employers' institutions are to be found the Common Provident Funds for the Benefit of Miners. They are more than half a century old, and it was the law of 28 March 1868 that recognized them as corporate entities.

No other example shows more the necessity of submitting the work of institutions of this kind to rigid rules, of which it is sufficient to prove the absolute necessity, in order to cause them to be accepted by the members themselves.

Six Common Funds were established, one for each mining district of the country. According to the first article of the law of 1868, the Provident Funds have for object to provide pensions and

assistance to "men employed in working mines, ores, quarries, and in workshops, and for the widows of these men and their families."

At the commencement, the pensions were, in general, only given to workmen who had become incapable of work on account of accidents arising from their occupation, and sometimes to the widows of workmen who had become infirm through the exercise of their occupation, and who had been engaged during a certain number of years in the industries connected with the Common Fund. An old age pension was the exception.

In five of the Provident Funds the income was mostly derived from a deduction from the wages, combined with a subvention from the employers.* Alone the Charleroi Fund placed from the commencement the contribution towards the pension and towards assistance as a charge on the employers. It must be remembered that the relations between receipts and disbursements was only empirically settled, and that a valuation of the liabilities is therefore impossible. Can it excite astonishment that the administrative committees should have insensibly deviated from the fundamental principles of the institution, and that they should have enlarged the sphere of action of the Funds at the risk of placing them in danger?

To-day the Common Funds grant at one and the same time pensions or assistance on account of accidents, and infirmities, and old age pensions. In one of them, while the annual costs arising from pensions given to infirm workmen has remained nearly constant during a period of 17 years, the cost arising from old age pensions has quadrupled during the same time.

In a report presented to the King in 1881, the Minister of Public Works set forth the financial position, which was not brilliant, of the Provident Funds, and the difficulty in maintaining equilibrium between the expenditure and the receipts. The administrative committee of the Fund of the Province of Liége, having proposed the augmentation —evidently arbitrary and empirical—of the rate of contributions, the Minister asked the King to approve it. Subsequently he adopted the resolution come to by the administrative committee, and having the object of abolishing all deductions from wages, the employers alone having for the future to bear the burdens, hitherto equally carried by the workmen and the employers. The justification put forward for this course is curious. "Provident societies are nothing else than "associations formed by employers with a philanthropic purpose. "They do not establish for the workmen any social bond, either "between themselves or with their employers. It is therefore only "from the employers that they should derive their support." If this is so, why not withdraw from the Common Funds their beautiful name of provident societies, and rank them simply under the head of benevolent societies? And if it can be admitted that a Fund for pension and assistance in case of accidents may receive its contributions from the employers alone, would anyone go so far as to say that an institution to provide retiring pensions should not ask of the workmen a personal effort, a participation in the formation of the fund for the pensions? To do so would be to give up all the great results hoped for by all those who interest themselves in the welfare of workers and the raising of the workman in his own estimation.

* The Common Funds receive, also, subsidies from the State and from the Provinces.

It is unfortunate that, granting the complex character of Common Provident Funds, the principle of non-intervention of the workmen should have been admitted. The mischief having been done, there is only one way to repair it, that is to divide into two parts these institutions, to retain for them solely their principal quality of societies to provide against workmen's accidents, and to found them upon new bases, which the actuary should be called upon to prepare; and then to join the function of providing retiring pensions to the Caisse Générale de Retraite.

The second portion of this reform programme was nearly being realized in 1891 by the affiliation of a hundred thousand Belgian miners to the Caisse de Retraite. It may be hoped that this solution will not be long in being applied.

Various important industrial societies have organized Provident Funds assuring their clerks and their workmen against the results of infirmity and old age: and it is interesting to note that efforts have been made to base these organizations on durable foundations. The principle has been laid down that the value of the pensions should be set up at the moment they come into effect, so as to avoid throwing upon the future, charges arising from the past; but they have generally fallen into a mistake common among all those who have only a rudimentary knowledge of the processes of actuarial science. To determine the present value of a current pension they take the expectation of life of a pensioner; they reduce it because the institution only pensions those individuals who are known to be infirm; then they multiply the daily amount by the number of days in the expectation of life thus arrived at, and they discount the result at a fixed rate!

It will be much better to say nothing of the purely empirical method employed to determine as a function of the salary the contribution intended to provide for the pension, nor the method of calculating the amount of the pensions.

Generally, these Pension Funds have, as sole income, a subvention from the employers, without any pecuniary contribution from those in whose favour they have been founded. We have already expressed our views on this system, which has only a material object, and takes no account of the moral improvement which must generally result from a succession of individual efforts on the part of the workman himself. We would add that the old age pension is only granted to those who have fulfilled a certain number of years of uninterrupted service.

Some financial establishments have founded Funds resembling, more or less, institutions for accumulating capital, and maintained by deductions from the salaries, combined with a subvention, generally of equal amount, allowed by the establishment.

The deduction of a portion of the salary does not prevent forfeiture of the rights of members as a result of resignation or dismissal, or for other causes.

The share acquired can, at the time of attainment of the age giving the right to retire, be applied if the employee so desire, to the acquisition of an annuity with reversion or not.

We now come to the system which, in the category of employers' institutions, appears to be the most simple, the most certain, and

the least exposed to the vicissitudes which can attack all those which we have rapidly sketched. It is that in which the employer relieves himself of the burden, difficult to bear, of old age pensions, by simply purchasing these from a society selling pensions, and solidly established. This is the most wide-spread in Belgium, and it would be still more so if the threat of compulsory insurance had not temporarily slackened the speed of the movement which had been going on in Belgium for several years, and of which M. Mahillon was one of the most ardent promoters. Under this system, a deduction varying from one to five per-cent of the wages, is combined with a contribution from the employers, generally equal to the amount deducted. These sums are paid in monthly to the Caisse Générale de Retraite to purchase annuities, to commence most often at 60 or 65 years of age. The deductions are generally paid in as contributions with return, and the subventions as contributions without return.

Several industrial establishments insist on membership for all new employees. We are not in favour of compulsion, no matter in what direction it may be applied, and specially when it concerns old age pensions; but we think that it may be included as one of the clauses in a labour contract freely accepted, especially if its rigour is tempered by the promise of a contribution by the employer.

It is not necessary to describe all the advantages of such a system, as well for the employer as for his clerks and workmen. If it leaves untouched the liberty and the dignity of these latter, it establishes equally clearly the position of the employer, who, by his advice, and his money, supports the worker in the rough road of thrift, and encourages him to practice a social virtue, the possession of which will raise him in his own eyes.

Moreover, the employer can relieve himself of the care and of the management of considerable sums, and the security of the workmen is as complete as it can be.

C. Caisse Générale de Retraite, founded under the Guarantee of the State.

We have, in what precedes, many times mentioned the Caisse Générale, founded under the guarantee of the State. We have already said that this organization is the only creation of the State in the matter of providence and assurance, which is nearly unimpeachable from the technical point of view. It is regulated by the law of 16 March 1865, modifying that of 8 May 1850. It is accessible to the general public, and permits to be acquired, up to a maximum of 1,200 francs, deferred annuities to be entered upon at any integral age between 50 and 65. The contributions can be made either on the non-returnable or on the returnable scale.

The rates are calculated according to scientific rules on the following bases, namely:—

(1) The rate of interest at 3 per-cent.
(2) The table of mortality that of Quetelet.
(3) Loading 3 per-cent.

The Caisse de Retraite can make its investments in any one of the following manners:—

(1) In the Belgian Public Debt or other securities guaranteed by the State.
(2) In the purchase of the bonds of the Provinces, Towns, or Communes of Belgium.
(3) Mortgages.
(4) In the purchase of bonds of Belgian Societies which, for at least five consecutive years, have been able to meet all their engagements by means of their ordinary resources.

The technical arrangements of this institution would have entirely conformed to the principles of actuarial science if the Legislature had not imposed upon it certain obligations which were not taken into account in the calculation of its rates of premium. The second paragraph of Article 50 of the law of 16 March 1865, stipulates in effect that if the member, whose maintenance depends on his own work, is the victim of an accident arising in his work, which produces permanent incapacity, he can immediately enjoy the annuity for which he has contributed for at least five years, so long as that annuity does not exceed 360 francs; and Article 54, of the same law, requires the Caisse to contribute towards the funerals of the indigent assured who die previous to entering into the enjoyment of their annuities.

The history of the Caisse Générale de Retraite can be divided into three distinct periods, which we shall briefly describe.

First Period. Under the Law of 8 *May* 1850.

The minimum annuity to be acquired was fixed at 24 francs. The Fund accepted contributions of 5 francs and over, but these remained without interest until the succeeding payments permitted of the purchase of the minimum annuity of 24 francs. The date of entry upon the annuities could only be fixed at 55, 60, or 65 years of age, and the annuities had to be deferred at least ten years. They could only be acquired on the non-returnable scale. The maximum annuity was fixed at 720 francs, and the payment of the annuities was placed in the hands of the collectors of contributions.

Great efforts were made to extend the knowledge of the new institution, but few members were acquired; and it was soon recognized that the small success of the very active canvass undertaken in favour of the Fund was due to the imperfections of the law.

From 1856, the administrative commission of the Caisse proposed various important modifications, and Government actively undertook investigations, preparatory to the formation of a Caisse Générale d'Epargne, to which the Caisse de Retraite should be annexed. It was only, however, in 1859 that a Bill with this object was submitted to the Chamber of Representatives by M. Fière-Orban, Minister of Finance. This Bill was discussed only in 1862, and in the Senate in 1864; and the law was passed only in 1865 (on 16 March).

In the meantime the Caisse de Retraite vegetated, the canvass ceased, because it was seen to be useless on account of the

imperfections of the law, and the public awaited the promised establishment of better conditions.

The law of 1865 rejoined the Caisse de Retraite to the Caisse d'Epargne, but it was, nevertheless, not applied, in so far as the former was concerned, until 1 August 1868.

Second Period. Under the law of 16 *March* 1865, *and the Royal Decree of* 8 *June* 1868.

The law of 1865 introduced into that of 1850 material changes, in so far as the Caisse de Retraite was concerned. The tables of rates were considerably extended. Two methods of securing annuities were adopted, namely, by contributions with and without return. The minimum annuity was fixed at 12 francs, and the minimum contribution at 10 francs.* Such sums as were insufficient to provide the minimum annuity were considered as savings' bank deposits, bearing interest. The entry into possession of the pension could be fixed at any integral age between ages 50 and 65, and the rates were calculated at 4½ per-cent interest.

At the commencement of the second period it is to be noticed that several adhesions were given to the Caisse de Retraite, among others, that of the clerks and workmen of the Compagnie du Nord.

The Government, by the law of 3 June 1870, allotted to each militiaman who had completed his term of service, the sum of 150 francs, and, besides, a sum of 12 centimes per day of attendance for the whole duration of his ordinary service, and of the service due to a recall to the ranks in times of peace. These sums were to be applied to the provision of life annuities, commencing at age 55.

Unfortunately, this law was repealed in 1875, and was only partially applied to militiamen of the classes of 1871 to 1874.

When the Caisse de Retraite began to operate under the law of 1865, it was already in active work, and the Caisse d'Epargne, which had just been founded, was the object of all the efforts in the way of propaganda. Many good folks were, moreover, convinced of the necessity of inculcating first the practice of thrift in its elementary form; and the uselessness of efforts made with the purpose of stimulating thrift in the direction of providing for old age, unless the public had first been educated in the direction of simple saving. It resulted from this that the Caisse de Retraite remained under a shadow; and a little later, when the cause of thrift was won, and when it was desired to make known the existence of the Caisse de Retraite, there arose a difficulty from the fear of seeing developed transactions in life annuities calculated at 4½ per-cent, at the time when the rate of interest on safe investments had already fallen to about 4 per-cent. So early as 1882 these fears were uttered, and from that moment it was apparently decided to commence a vigorous propaganda in favour of the Caisse de Retraite, only when it should be possible to make use of tables of rates calculated at lower interest.

It can, therefore, be said that during this second period the Caisse de Retraite was voluntarily neglected, and it is, therefore, not to be wondered at that it continued to be almost completely ignored.

* Since 1889, the minimum contribution has been lowered to one franc, and since 1896 the minimum annuity has been fixed at one franc.

Third Period. Under the Law of 16 *March* 1865 *and the Royal Decree of* 13 *July* 1887.

The Royal Decree of 13 July 1887 fixed new tables of rates based upon a rate of interest of 3 per-cent, which were brought into operation as from 1 January 1888.

From that moment no financial reason opposed the undertaking of a great propaganda in favour of the Caisse de Retraite, and that formed the starting point of a very remarkable extension of the operations of that Fund. Before 1888 the number of annual contributions had rarely exceeded 3,000, but the following are the number of successive annual contributions since 1888:

In 1888 . .	4,887	In 1893 . .	58,882
„ 1889 . .	6,832	„ 1894 . .	69,242
„ 1890 . .	18,567	„ 1895 . .	85,477
„ 1891 . .	30,970	„ 1896 . .	111,020
„ 1892 . .	45,336	„ 1897 . .	171,506

D. Diverse Systems.

The great popularity of the "Prévoyants de l'Avenir" in France was not without its effects in Belgium. It was not forgotten that the system of that society consists essentially in the accumulation of capital produced by contributions, and in the distribution of the interest upon this inalienable capital among all the participants who have completed a certain period (20 years).

It is not for us to set forth the defects of this system. MM. Prosper de Lafitte and Léon Marie in sundry publications, and M. Lourties, in his remarkable report to the French Senate, have done full justice to them. Nevertheless, we have witnessed the formation in Belgium, within recent days, of several associations of this kind; and they seem to extend their operations, especially among the working classes. The majority of them, it is true, have introduced certain palliations in the business arrangements of the "Prévoyants de l'Avenir." They have limited their earlier dividends, and they have in reality rendered less brutal the spoliation made by the founders to the detriment of their fellow members; but they are not the less to be condemned, although they have often been organized by honourable men, and in perfect good faith. It is not without a feeling of sadness that one is led to the conclusion that honourable people, guided by the most praiseworthy sentiments, have arrived at the belief that there are equitable arrangements under which annuities of 90 francs can be secured, no matter what may be the age of the members, for an average of 15 annual payments of 6 francs, and that solely by means of interest on accumulated capital.

Since 1895 four Bills relating to the assurance of workmen against old age and infirmity have been submitted to the Chamber of Representatives by MM. Defuisseaux, de Guchtenaere, de Malander, and Denis.

These Bills are based upon the principle of compulsion, and are inspired rather by sentimental views, than by the necessity of bending

organizations of this kind to scientific rules. Two of them, that of M. Defuïsseaux and that of M. Denis, are based upon the primitive idea of division, which their authors set up against the system of accumulation.

It is not without interest to call attention to the fact that the system of division, which consists essentially, as is well known, in the entire distribution for current pensions of all the annual receipts, has enjoyed for some time a great popularity in Belgium, even among persons well-enlightened, who have been seduced by the appearance of simplicity which cannot be denied to this system, and by the advantage it holds forth in not giving rise to any trouble about investments. But most happily this infatuation is being dispelled gradually by study and by thought. The demonstration made by actuaries that the adoption of a system of division would result in much more serious sacrifices, because this system costs, under normal circumstances, three times as much as the system of accumulation, and the criticisms, which have not been refuted, brought forward against the German system at the last Congress on workmen's accidents by the Belgian actuaries, have produced the effect which was intended, and a growing tendency may be observed in intellectual circles towards the rejection of all methods departing from scientific teaching, and in favour of an absolute respect for technical requirements in the matter of thrift and insurance.

An extra-Parliamentary Commission was formed in 1895 to examine into the question of workmen's pensions.*

The work of that Commission is not yet finished. Nevertheless, it is not unknown that it has pronounced against the principle of compulsion. Without prejudging in any respect its report, it may be said that it will certainly have to take account of a movement which seems to have taken place during the last two years among a notable portion of the Belgian working population in the direction of wise provision for old age.

The Caisse Générale d'Epargne et de Retraite can claim the credit of a great portion of the results already achieved. Since 1888, by an unintermitted canvass, by the distribution of numerous pamphlets in popular language, disseminated throughout the whole country from 900 offices,† it has inculcated thrift in its various shapes.

Then these efforts came to be assisted by the powerful intervention of public bodies, given effect to in the shape of subsidies. It was first the State itself which, in encouraging in this way the affiliation to the Caisse Générale de Retraite of the members of friendly societies by annual grants, of which the last for 1897 reached 100,000 francs, increased in rapidly growing proportions the number of workmen freely joining the Caisse de Retraite, and making to it personal payments to which were added the State subventions. Then it was the Provinces, which in their turn brought into their annual budgets subsidies having the same destination. Several Communes have already followed this example, and it is to be expected

* Three Fellows of the Association of Belgian Actuaries were members of that commission.

† The central office at Brussels, provincial branches, post offices, and agencies of the National Bank.

that charitable institutions, which in the end will experience sooner or later by a diminution of their protégés the beneficent effects of all these combined efforts, will also follow suite.

The results achieved are worthy of record. In 1894 the number of new members of the Caisse de Retraite was 4,438; it increased to 5,790 in 1895; 10,549 in 1896, and to 17,159 in 1897; and they were 3,121 for the month of January alone in 1898. This is, nevertheless, only a beginning, because, in addition to the workmen entered by their employers, and to those brought in by the friendly societies,* there will presently be inscribed the population of the primary schools of the whole of Belgium. In fact, in 1896, there originated in a relatively poor district of the country a movement due to the initiative of an educational functionary, with whose efforts the Caisse Générale de Retraite hastened to associate itself. Very soon pension societies sprang up in the schools, with the view of being affiliated to the Caisse de Retraite.† These are recognized by the Government, and will obtain their share of the subsidies of public bodies. Their number grows from day to day.

Thus, thanks to a propaganda which has not wearied, and thanks to the intervention of public bodies supplementing the efforts freely made for provision for old age, we see increasing without cessation, on the one hand the number of adult members, and on the other hand the number of scholars in the schools, each one holding a personal certificate.

For these last, who, on leaving school, may be gathered in by the friendly societies affiliated to the Caisse de Retraite, are we not entitled to say that, if they so will, the problem of old age pensions may be considered to be solved? As to the adults, it results, from the first conclusions of a work which we are preparing for the Workmen's Pension Commission, in the conditions where the intervention of public bodies actually takes place within the limits of annual individual payments varying from 3 to 12 francs, and without taking account of any contribution by employers, the workmen who commence periodical payments at 28 years of age will secure at 65 years of age a pension of 270 francs.

Is it necessary for us in Belgium to seek for any other solution? We do not think so. In our view the intervention of public bodies is only justified when it is added to individual effort not due to legal compulsion. These efforts are easy to those who possess the trinity of social virtues, without which no thrift is possible, namely, sobriety, order, economy. Reciprocally, we may hope to bring to birth, and to develope these virtues, by teaching in early life the spirit of providence, and in encouraging it in every possible way. It is on these paths that Belgium appears to be entering, and we express the hope that she will persevere therein.

* The number of friendly societies which enter their members at the Caisse de Retraite grows daily. It amounted to 410 on 31 December 1897.

† The law of 9 August 1897 lowered to 6 the minimum age of entry to the Caisse de Retraite, originally fixed at 10.

LES PENSIONS DE RETRAITES EN FRANCE.

Par H. DUPLAIX,

Actuaire de la Compagnie d'Assurances Générales sur la Vie à Paris.

Ce rapport comprend dans sa première partie:

1°. Une étude succincte des conditions de fonctionnement de notre Caisse des Retraites pour la Vieillesse instituée par l'État.

2°. Un exposé de différentes lois s'appliquant: soit en général aux caisses de retraites patronales au profit des ouvriers et employés; soit plus particulièrement, aux caisses de retraites des compagnies de chemins de fer et des exploitations minières.

Dans la crainte que notre étude ne fasse double emploi avec le rapport de l'un de nos collègues, nous n'avons pas examiné les conditions de fonctionnement des caisses de retraites des sociétés de secours mutuels. Ces sociétés n'accordent d'ailleurs le plus souvent que des secours viagers, au fur et à mesure des ressources disponibles. Ces pensions éventuelles sont fournies par un fonds de retraites, déposé à la Caisse des Dépôts et Consignations. (Ce fonds a été institué par décret du 26 avril 1856.) Remarquons aussi que le montant de ces pensions est généralement bien inférieur au montant des retraites servies par les caisses patronales.

Enfin, pour donner une idée des tendances qui se manifestent, en France, dans la question des retraites ouvrières, nous avons rapidement analysé dans la *deuxième partie* de ce rapport différentes propositions de lois présentées au Parlement durant ces dernières années.

Caisse Nationale des Retraites pour la Vieillesse.

Cette caisse a été créée par la loi du 18 juin 1850, dans le but de mettre à la disposition du travailleur économe et prévoyant, un établissement propre à recevoir et à capitaliser les épargnes destinées à la consti-

tution d'une pension de retraite. Placée sous la garantie de l'État, gérée par la Caisse des Dépôts et Consignations,[1] cette institution est actuellement régie par la loi du 20 juillet 1886.

Le taux de l'intérêt à servir aux déposants varia de 5 % à 4½ %, depuis l'année 1850 jusqu'en l'année 1882. Cette fixité d'un taux supérieur au taux d'intérêt de la rente eut pour résultât: d'encourager la spéculation et de créer pour la caisse des déficits qui ne s'élevèrent pas à moins de 75 millions en sept années (de 1875 à 1882). Maintenant, le taux de l'intérêt gradué par quart de franc est fixé par décrets annuels; les placements anciens et d'autres assez avantageux en obligations départementales et communales[2] ont permis de le maintenir depuis 1891 à 3 fr. 50 c. % (correspondant à un taux annuel de 3,546 %). Les fonds de cette caisse sont employés en rentes sur l'État, en valeurs du Trésor ou garanties par le Trésor; ou bien encore en obligations départementales et communales.

Depuis 1887 la table de mortalité CR, dressée d'après les statistiques de la caisse elle-même, a remplacé la table de Deparcieux primitivement adoptée.

Les versements effectués dans une année au compte de la même personne ne peuvent pas dépasser 500 francs (excepté pour les versements faits par les sociétés de secours, ou les caisses de retraites d'ouvriers mineurs).

Ces versements sont reçus à capital aliéné ou à capital réservé.

Les sommes versées pendant le mariage profitent, séparément et par moitié aux deux conjoints.

La caisse ne constitue pas de rentes sur deux têtes. Il y a évidemment là une lacune que la clause précédente ne saurait combler; car elle impose, au premier décès, une réduction importante du chiffre de la retraite.

Le montant de la pension ne peut, dans aucun cas, être supérieur à 1,200 francs. L'entrée en jouissance est fixée, au choix du déposant, à partir de l'âge de 50 ans jusqu'à l'âge de 65 ans. Dans le cas de blessures ou infirmités entraînant une incapacité absolue de travail, la pension peut être anticipée; elle est déterminée en proportion des versements déjà effectués et peut être bonifiée par un crédit ouvert chaque année au budget du Ministre du Commerce. (En 1896 ce crédit s'est élevé à 15,000 francs, il s'est augmenté du revenu de la moitié du produit de la vente des joyaux de la couronne affectée à titre de dotation spéciale au service des bonifications.)[3] Le montant des pensions bonifiées ne peut être supérieur au triple produit de la liquidation, ni dépasser un maximum de 360 francs.

Les rentes constituées par la Caisse Nationale sont incessibles et insaisissables, jusqu'à concurrence de 360 francs.

Ajoutons enfin, qu'en vertu de la loi du 31 décembre 1895, une somme de deux millions a été versée en 1896 à la Caisse Nationale pour constituer une majoration de retraite définitive à tout participant âgé

[1] Depuis le 1er Janvier 1891 les frais de gestion de la Caisse nationale des retraites sont remboursés par cette Caisse à la Caisse des Dépôts et Consignations.

[2] Cependant en 1896 le revenu net des prêts communaux et départementaux ne ressortait plus qu'à 3 fr. 55 c. %. La même année le revenu moyen de l'ensemble du portefeuille était de 3 fr. 76 c., 227 %.

[3] Loi du 31 décembre 1895.

d'au moins 70 ans, n'ayant pas un revenu personnel, viager ou non, supérieur à 360 francs. Cette majoration n'étant d'ailleurs acquise que si le titulaire a effectué pendant un certain nombre d'années des actes de prévoyance ; soit par des versements à une caisse de retraites, soit par des cotisations à une société de secours-mutuels.

Dans les versements effectués à la Caisse Nationale des Retraites il y a lieu de distinguer : 1°, ceux qui sont faits par les collectivités (compagnies de chemins de fer, compagnies minières, sociétés de secours-mutuels, caisses patronales, etc.). 2°, ceux qui sont faits par versements individuels.

Le nombre des premiers a plus que doublé en cinq ans, tandis que le nombre des seconds ne s'augmentait que de 15 %.

On peut s'en rendre compte par le tableau suivant de l'état comparatif des versements collectifs et des versements individuels, de l'année 1892 jusqu'en l'année 1896.

Années	Versements					
	Collectifs		Individuels		Total	
	Nombres	Sommes	Nombres	Sommes	Nombres	Sommes
		fr.		fr.		fr.
1892	841,939	19,782,672·10	30,652	13,017,312·30	872,591	32,799,984·40
1893	947,792	21,678,861·44	29,035	12,099,421·61	976,827	33,778,283·05
1894	1,012,412	24,395,936·24	29,308	6,649,401·61	1,041,720	31,045,337·24
1895	1,306,645	25,628,635·14	32,213	7,009,499·75	1,338,858	32,638,134·89
1896	1,776,266	30,696,748·96	35,419	7,216,614·00	1,811,685	37,913,362·96

Voici d'autre part pour les mêmes années les proportions des déposants collectifs : 84·08 % en 1892 ; 91·79 % en 1893 ; 87·59 % en 1894 ; 96·38 % en 1895, et 94·01 % en 1896.

Les sommes versées par la Compagnie des Chemins de Fer P.L.M. au profit de ses agents embrigadés explique en partie l'augmentation de l'année 1892 à l'année 1893. Les augmentations suivantes proviennent surtout de l'application de la loi du 29 juin 1894 relative aux exploitations minières.

Bien que la moyenne des versements collectifs (17 francs en 1896), soit de beaucoup inférieure à la moyenne des versements individuels (204 francs en 1896), les collectivités n'en sont pas moins et de beaucoup les plus importantes clientes de la Caisse Nationale des Retraites pour la Vieillesse.

Remarquons enfin que les versements opérés par les caisses de retraites des sociétés de secours-mutuels sont en diminution, malgré les subventions allouées à ces versements par le Ministre de l'Intérieur. Les sociétés de secours-mutuels ont d'ailleurs une tendance à servir elles-mêmes leurs pensions à l'aide des intérêts à 4½% fournis par leurs comptes de dépôts.

Caisses Patronales.

En France, les caisses de retraites au profit des ouvriers et employés se sont multipliées pendant ces dernières années.

L'exemple donné tout d'abord par l'État, les sociétés de secours-mutuels et les compagnies de chemins de fer, a produit l'heureux effet

d'entraîner nombre d'industriels et d'administrations privées, aux plus généreuses initiatives.

Bien que la statistique ne nous ait pas encore donné le nombre exact des caisses patronales, leur développement nous paraît indéniable.[1] De toutes parts, dans le commerce, dans l'industrie, des caisses ont été créées et dotées par les patrons, soucieux d'assurer une retraite à leurs ouvriers. Le plus souvent, du reste, ces institutions n'ont pas tardé à créer des liens étroits de solidarité, et parfois même d'affection entre le patron et le salarié.

L'ouvrier évite les grèves fournit un effort plus durable et plus régulier, s'intéresse d'une façon plus intime au succès de l'entreprise quand la sécurité de ses vieux jours dépend de ce succès.

Les conventions qui interviennent entre les patrons, les ouvriers et les employés, dans l'établissement des caisses particulières de retraites, sont multiples et variées. Les statuts de ces caisses sont inspirés par les considérations les plus diverses; les unes sont fondées à titre de pure libéralité, les autres imposent aux adhérents des versements corrélatifs à ceux des patrons; certaines d'entre elles servent directement leurs pensions, d'autres les constituent à la Caisse Nationale des Retraites pour la Vieillesse au moyen de livrets individuels.

La loi du 27 décembre 1895 limite l'emploi des fonds des caisses patronales en rentes sur l'État, obligations départementales ou communales, valeurs du Trésor ou garanties par le Trésor, obligations foncières et communales du Crédit Foncier, ou en valeurs émanant d'établissements reconnus d'utilité publique.

En outre, les retenues sur les salaires et les sommes que les chefs d'entreprises promettent ou s'engagent à fournir en vue d'assurer des pensions de retraites doivient être versées: soit à la Caisse Nationale des Retraites, au compte individuel de chaque adhérent; soit à la Caisse des Dépôts et Consignations; soit encore à des caisses syndicales ou patronales autorisées par décret et soumises au contrôle de l'inspection des finances.

La même loi reconnaît aussi aux ouvriers le droit de réclamer, en cas de faillite ou de liquidation judiciare, la restitution de toutes les sommes versées à la caisse et non utilisées conformément aux statuts. En cas de cession volontaire, le droit à la restitution reste le même; à moins que le cessionnaire ne consente à prendre les lieu et place du cédant.

Le réglement d'administration publique du 14 octobre 1897 a d'ailleurs fixé les bases des calculs qui servent à déterminer le montant des droits acquis ou éventuels des adhérents à une caisse de retraites, lors de la liquidation.

La loi du 27 décembre 1895 a créé en faveur de l'ouvrier une garantie dont l'utilité n'est pas discutable; mais l'intervention de l'État a inquiété les patrons et ralenti l'impulsion vers le création de nouvelles caisses patronales.

Caisses réglementées par des Lois spéciales.

La loi du 27 décembre 1895 est applicable à toutes les caisses de retraites, elle n'établit aucune distinction entre les différentes entre-

[1] Depuis que ceci est écrit l'Office du Travail a publié une intéressante enquête sur les Caisses Patronales des établissements soumis à l'Inspection du Travail.

prises. Cependant, les caisses de retraites des mines, des compagnies de chemins de fer, et des sociétés de secours-mutuels sont réglementées par des lois spéciales. Notons aussi que les caisses particulières de certains établissements, dépendant plus ou moins de l'État, ont été organisées par décrets ou arrêtés ministériels. Citons comme exemples : La caisse des pensions de retraites des employés du Mont de Piété de Paris (décret du 23 juillet 1882) ; la caisse de retraites des Écoles Nationales d'Ouvriers, de contre-maîtres, d'apprentissage (arrêté ministériel du 25 fevrier 1892) ; la caisse de retraites en faveur des employés des chemins de fer de l'État (décret du 13 janvier 1883).[1]

Caisses de Retraites des Ouvriers Mineurs.

L'obligation de constituer des pensions de retraites a été imposée par la loi du 29 juin 1894, aux exploitants des mines et à leurs ouvriers.

L'exploitant verse chaque mois, soit à la Caisse Nationale des Retraites pour la Vieillesse, soit à une caisse syndicale ou patronale autorisée par décret et placée sous le contrôle de l'État, une somme égale à 4 % du salaire des ouvriers. Moitié du versement est prélevée sur le salaire, l'autre moitié est fournie par le patron. Les ouvriers et employés ne sont admis au bénéfice de la loi que jusqu'à concurrence d'un traitement de 2,400 francs.[2] Les versements sont inscrits sur un livret individuel au nom de chaque ouvrier ou employé et les pensions sont liquidées d'après les bases de calculs adoptées par la Caisse Nationale des Retraites. L'entrée en jouissance, fixée à l'âge de 55 ans peut-être differée sur la demande de l'ayant-droit et la réserve du capital n'est admise que pour la part du versement prélevée sur le salaire.

L'application de la loi sur les retraites des ouvriers mineurs n'a eu lieu d'une façon complète qu'à dater de l'année 1896 ; pendant cette même année le nombre des versements des exploitants des mines s'est élevé à 400,158, correspondant à un chiffre total de 3,400,619 francs 31 centimes.

Il n'est pas inutile d'ajouter que, antérieurement à la loi de 1894, la presque totalité des entreprises minières avaient crée, en faveur de leurs ouvriers, des caisses de retraites administrées souvent de la façon la plus libérale.

Caisses de Retraites des Chemins de Fer.

La loi du 27 décembre 1890 soumet à l'homologation ministérielle les statuts et règlements des caisses de retraites et de secours des compagnies de chemins de fer.

En exécution de cette loi, la plupart des règlements des compagnies ont été révisés et présentés à l'homologation.

Les différents documents fournis par les compagnies à l'appui de

[1] Cette caisse servait au 31 décembre 1895, 54,028 francs d'arrérages à 158 titulaires (soit en moyenne une rente de fr. 341.95). Elle est alimentée par la retenue du 1er douzième, une retenue de 5 % sur les traitements et une subvention de l'État égale à 10 % (depuis le 1er janvier 1896).

[2] Les versements sont obligatoires jusqu'à 55 ans ; ils deviennent facultatifs à partir de cet âge.

leur demande parurent insuffisants pour évaluer l'importance relative des ressources et des engagements prévus ; et le 28 février 1894 le Comité Consultatif émettait l'avis suivant :

" Que, avant d'homologuer les statuts et règlements, il y avait lieu " de mettre en demeure les différentes compagnies de produire :

" 1°. Dans un délai de quatre mois, les travaux statistiques et les " calculs nécessaires pour chiffrer les charges annuelles destinées à " assurer le service normal des retraites.

" 2°. Dans un délai d'un an, les documents nécessaires pour déter- " miner les charges qui sont la conséquence de l'insuffisance des verse- " ments antérieurs.

" 3°. De faire vérifier ces documents par l'inspection des finances."

Depuis cette époque de très intéressantes statistiques ont éte fournies par différentes compagnies, et notamment par la Compagnie de l'Ouest, qui a confié à un actuaire éminent (Monsieur Laurent) le soin d'établir les calculs relatifs à sa caisse de retraites.

Cependant, jusqu'à présent, aucun travail d'ensemble n'a été publié sur les chiffres produits par les grandes compagnies de chemins de fer, et aucun règlement n'a pu être homologué.

Une solution ne saurait toutefois tarder à intervenir, maintenant que l'abondance des documents déjà rassemblés permettra au comité d'être bientôt fixé sur la valeur des éléments d'appréciation que seules les compagnies pouvaient lui fournir, par exemple : la durée moyenne des services, l'âge moyen des mises à la retraite, la proportion des agents mariés, le chiffre moyen des traitements, etc., etc.

À l'origine les Caisses de Retraites des Compagnies de Chemins de Fer étaient facultatives, les compagnies se bornaient alors à faire un versement égal à celui que l'agent avait librement consenti (en général 3 ou 4% du traitement).

La retraite servie, soit par la Caisse Nationale, soit par une caisse spéciale, était déterminée au moment de la liquidation, en proportion des versements effectués.

Dans les règlements actuellement en vigueur, le principe est tout différent. La retenue est obligatoire, et la compagnie s'engage à servir une pension s'élevant à peu près à la moitié du traitement moyen des six dernières années de service.

La rente est, le plus souvent, réversible sur les veuves et les orphelins.

Les conditions requises pour l'allocation de la retraite sont généralement les suivantes : avoir 55 ans d'âge et 25 années de service soumises à la retenue ; sauf dans le cas d'infirmités graves donnant droit à une retraite anticipée.

Cette règlementation a eu pour effet d'augmenter constamment le nombre d'adhérents aux caisses de retraites et de créer des charges de plus en plus lourdes aux compagnies de chemins de fer. On peut en juger par les chiffres suivants que nous empruntons à un intéressant rapport de Monsieur Chauchat.

Pour les six compagnies (Est, État, Lyon, Midi, Orléans, Ouest), le nombre total des agents faisant partie des caisses de retraites s'élevait à 79,189 en 1875, 120,512 en 1882, et 167,535 en 1892.

Le service des pensions nécessitait les annuités suivantes: 15,135,882 francs en 1888 ; 15,632,997 francs en 1890 ; et 25,217,177 francs en 1892.

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Les charges qui résultaient de l'accroissement rapide du montant des pensions à servir, s'aggravèrent encore par le fait de la baisse constante du taux de l'intérêt. Les compagnies furent dès lors obligées d'augmenter dans une large mesure les subventions qu'elles fournissaient à leurs caisses de retraites. Citons quelques exemples :

La caisse des retraites de la compagnie P.L.M.—

En 1889 la retenue était de 4%, la dotation de 6%
„ 1894 „ „ „ „ 4%, „ „ „ 8%

Cette dernière compagnie prévoyait d'ailleurs que le chiffre des allocations annuelles devrait s'élever à 14 ou 16% pour assurer le fonctionnement de la caisse.

La caisse des retraites de la Compagnie du Nord—

En 1889 la retenue était de 3%, la dotation de 3%
„ 1894 „ „ „ „ 3%, „ „ „ 9%

La caisse des retraites de la Compagnie de l'Ouest—

En 1889 la retenue était de 4·2%, la dotation de 5·2%
„ 1894 „ „ „ „ 4·2%, „ „ „ 8·2%

Le nombre des adhérents et les charges des compagnies ont encore considérablement augmenté pendant ces dernières années.

Les compagnies de chemins de fer ont cherché à se prémunir contre la baisse probable du taux de l'intérêt, en versant à la Caisse Nationale des Retraites, au compte individuel de chaque nouvel agent, tout ou partie des allocations annuelles. Le Nord et l'Ouest versent à cette caisse la retenue opérée sur le traitement ; le syndicat des Chemins de Fer de Ceinture verse la totalité de l'allocation pour constituer à l'employé un livret individuel.

Le système du livret individuel, alimenté par les retenues et les dotations des compagnies, tend à être généralement adopté. Par ce système, les compagnies se débarrassent de la gestion, souvent pénible, de leurs caisses de retraites et aussi de l'incertitude relative aux charges qu'elles assument.[1] Elles espèrent d'ailleurs que des primes données à l'ancienneté suffiront à retenir les agents, qui par la durée de leurs services auront acquis une précieuse expérience.

La Compagnie P.L.M. s'est déjà inspirée de cette tendance, dans le règlement d'une caisse de retraites créée le 30 avril 1892, au profit de ses agents embrigadés.

Une retenue de 4% et une allocation de la compagnie, croissant de 4% à 6% avec la durée des services, servent à constituer à la Caisse Nationale des Retraites un livret individuel qui est la propriété de l'agent.

En second lieu, la compagnie garantit à tout agent comptant 25 ans de service et 55 ans d'âge (ou seulement 15 ans sans limite d'âge en cas de blessures) une indemnité de congédiement de 4% par année de service.

Faisons encore quelques remarques :

La Caisse Nationale n'accepte pas de versements annuels supérieurs à 500 francs, et la rente assurée sur une même tête ne peut dépasser

[1] Elles profitent ainsi dans une large mesure des tarifs trop bas de la caisse des retraites.

1,200 francs ; par suite les compagnies de chemins de fer sont obligées de conserver en partie, la charge du service des pensions allouées aux agents à gros traitements.

En outre, d'après le règlement de la Caisse Nationale des Retraites, les versements faits pendant le mariage profitant séparément à chacun des deux conjoints par moitié ; il en résulte une réduction de la rente, au premier décès. Cette réduction ne s'accorde pas avec un principe généralement admis dans les caisses de retraites des chemins de fer, à savoir, que la rente doit être servie intégralement jusqu' au décès du mari.

(Voir dans le tableau ci-dessous les versements effectués en 1896 par différentes compagnies de chemins de fer à la Caisse Nationale des Retraites.)

Compagnies	Versements à capital aliéné.		Versements à capital réservé		Total des Versements	
	Nombre :	Sommes	Nombres	Sommes	Nombres	Sommes
		fr.		fr.		fr.
du Nord... ...	16,579	76,749	163,520	1,261,678	180,099	1,338,427
de l'Ouest ...	15,535	174,090	197,740	1,737,043	213,275	1,911,133
d'Orléans ...	726	42,304	29,856	3,042,259	30,582	3,084,563
de P.L.M. ..	1,348	502,550	94,647	1,977,547	95,995	2,480,097
de Ceinture ...			7,244	185,686	7,244	185,686
de l'Est Algérien	788	8,237	4,643	49,886	5,431	58,123

Propositions de Lois.

Les deux dernières législatures du Parlement français ont vu éclore de nombreuses propositions relatives à la creation d'une Caisse Nationale de Retraites pour les travailleurs. Les pouvoirs publics, sous le Ministère Constans, ont pris eux-mêmes l'initiative d'un projet pour lequel l'urgence a été déclarée.

Renvoyés à des commissions diverses, ces différents projets se sont heurtés aux objections les plus sérieuses et aucun d'eux n'a pu encore aboutir.

Les spécialistes en la matière se sont du reste livrés, soit à la Chambre, soit dans les journaux et les revues spéciales, aux plus intéressantes discussions, tant sur la valeur théorique des solutions, que sur l'économie générale des systèmes.

Les actuaires ont relevé de nombreuses erreurs dans les calculs, rarement conformes aux données de la science actuarielle. Les statistiques leur ont paru le plus souvent douteuses ou inexactes.

Parfois aussi : ils ont constaté que la peréquation était plus apparente que réelle, entre les ressources véritables et les charges prévues.

Plusieurs ont regretté que l'on ait conservé, dans la plupart des propositions, le principe de la rente à capital réservé ; principe qui conduit à une diminution notable du chiffre de la pension, pour ne donner droit qu'à un capital insignifiant, si le décès se produit dans les premières années ; ou à un capital plus important, mais dont l'utilité est discutable, si le décès survient à l'époque de la vieillesse alors que les charges de famille se sont généralement atténuées, si toutefois elles n'ont pas totalement disparu.

D'autres enfin, auraient désiré que l'on séparât plus nettement la retraite pour la vieillesse de la retraite d'invalidité, et aussi que l'on

n'abaissât pas au-dessous de 65 ans l'âge qui donne droit à la liquidation de la pension.

Les économistes s'émeuvent de l'accumulation dans la caisse, de capitaux se chiffrant par milliards ;[1] accumulation qui est la conséquence fatale de la plupart des systèmes.

Ils redoutent de ce fait, une perturbation profonde du marché financier et une baisse du taux de l'intérêt créant pour l'avenir des charges absolument incalculables.

Ces mêmes économistes s'inquiètent de l'appel fait, par quelques uns de ces projets, à des droits et des impôts capables de bouleverser complètement le système de distribution des richesses.

Ils sont d'ailleurs nombreux ceux qui voient dans une codification nouvelle, soumettant les caisses de retraites à des règles plus ou moins étroites, une mesure capable d'enrayer le développement des caisses particulières qui résolvent souvent le problème de la retraite par les solutions les plus ingénieuses et les plus variées.

L'analyse succincte que nous allons faire des différentes propositions et des objections qu'elles ont soulevées dans notre pays, permettra d'ailleurs à chacun de dégager les tendances diverses qui se manifestent en France, dans la question des retraites ouvrières.

Nous distinguerons parmi ces propositions :

1°. Celles qui tirent leurs ressources uniquement de l'impôt.

2°. Celles qui imposent à l'ouvrier la retraite obligatoire.

3°. Celles qui encouragent l'effort individuel, sans créer l'obligation.

Propositions basées sur l'Impôt.

Dans cette catégorie se placent les projets de Messieurs Laisant, Lacôte, Chassaing, et Chautemps.

Dans la proposition Laisant la caisse est alimentée par une contribution, fixée à 5 centimes par journée de travail, imposée au patron et par une contribution égale pour chaque ouvrier étranger qu'il emploie. À ces ressources s'ajoutent des droits de douane sur les matières alimentaires de première nécessité. Une pension minima de 500 francs est servie, au fur et à mesure des ressources disponibles, aux vieillards de plus de 60 ans ; en commençant par les plus âgés.

Dans la caisse de retraites de Mr. Lacôte, une pension de 500 francs est acquise à tout Français, riche ou pauvre, âgé au moins de 60 ans. La caisse est alimentée par une annuité de 150 millions fournie, moitié par l'État, et moitié par une caisse de secours temporaires dont la création est en même temps prévue.

Les ressources proviennent d'une contribution variant de une à deux journées de travail, suivant les salaires, et d'impôts sur les célibataires et les ouvriers étrangers. Les fonds de la caisse doivent servir à l'amortissement de la dette publique.

Monsieur Chassaing veut que sa caisse soit : immédiate, universelle et gratuite pour tous les Français qui justifieront d'un revenu inférieur au montant d'une pension fixée par la loi, et variant de 300 à 800 francs suivant le lieu de naissance. Le service des pensions est assuré par la suppression de l'hérédité en ligne collatérale et par des droits progressifs

[1] D'après le rapport de Mr. Guieysse, le régime permanent nécessiterait dans le projet du Gouvernement un capital de douze milliards.

qui varient de 1 à 75 % sur les successions en ligne directe et les donations entre vifs.

La proposition Chautemps trouve également ses ressources dans les droits de successions; la pension est acquise à 60 ans, le montant en est fixé par le conseil municipal soit de la commune d'origine, soit de la dernière commune habitée par le titulaire. L'État rembourse aux communes la moitié des sommes nécéssaires au service des pensions.

Dans la proposition Jouffray, la pension varie suivant les communes, de 200 à 500 francs, elle est acquise à toute personne incapable de subvenir à ses besoins. Les charges sont supportées, un quart par la commune, un quart par le département et moitié par l'État. De nouveaux droits imposés aux successions et aux patrons permettent d'alimenter cette caisse.

À ces propositions se rattache celle de Monsieur Emile Rey tendant à créer une caisse de dotation au profit des enfants indigents. Le capital payable à la majorité est fixé de 500 à 1,000 francs, dont le quart doit servir à constituer une retraite.

Ces différents projets ont soulevé les critiques les plus vives. On leur a notamment reproché :

De créer une regrettable confusion entre l'assistance publique et la prévoyance, en admettant que l'indigence donne le droit à une pension de retraite;

De décourager l'initiative et l'éffort individuel en plaçant l'ouvrier économe et laborieux au même rang que l'ouvrier paresseux et imprévoyant; de donner même, dans la pratique, une situation privilégiée au second, réduit le plus souvent par son inconduite à l'indigence qui lui assurera les bienfaits de la loi.

De faire appel à des ressources difficiles, sinon impossibles à évaluer, ayant pour conséquence immédiate de gréver lourdement l'État, les communes et les particuliers.

En outre, on a considéré que des droits s'élevant jusqu à 75 % sur les successions en ligne directe porteraient une grave atteinte à la propriété privée et que les droits de douane prévus dans le premier projet imposeraient de lourdes charges aux familles nombreuses, atteintes plus que les autres, par les impôts indirects.

On doit faire d'ailleurs les réserves les plus expresses en ce qui concerne la technique des projets.

Le montant des pensions est généralement déterminé de la façon la plus arbitraire; l'estimation du nombre des pensionnés, et l'évaluation des ressources destinées à alimenter les caisses de retraite sont établies sur les bases les plus discutables.

Propositions créant la Retraite obligatoire.

Les auteurs de ces projets paraissent s'être inspirés de la loi allemande.

Dans la proposition Isambard et Goujon, les versements à la Caisse des Retraites sont obligatoires de la quinzième à la soixantième année, pour les ouvriers des deux sexes et les employés dont le traitement est inférieur à 3,000 francs. Pour les autres ils sont facultatifs.

Les patrons sont tenus de verser à la caisse une somme de dix

centimes retenue sur la journée de salaire de tout ouvrier Français et une contribution égale pour les ouvriers étrangers qu'ils emploient.

Chaque annuité, correspondant à trois cents journées de travail effectif, donne droit à une pension de 13fr. 34c. à dater de l'âge de 60 ans. En cas de maladie entrainant une incapacité absolu de travail, une pension, proportionelle aux versements effectués, est acquise quelque soit l'âge.

La victime d'un accident du travail a droit à une pension variant de 500 à 800 francs.

D'après les calculs de Messieurs Isambard et Goujon, la charge annuelle pour le service des pensions nécessiterait une annuité de un milliard et demi ; à l'époque de plein fonctionnement de la caisse.

Monsieur Michelin propose d'accorder une pension annuelle et immédiate de 365 francs à tout invalide et à tout indigent âgé de plus de 60 ans.

À l'époque de la promulgation de la loi, le service de ces retraites serait assuré par des subventions puisés par les communes sur le capital et sur les revenus de l'assistance publique et par un impôt sur la richesse.

Monsieur Michelin prévoit aussi la création d'une caisse de retraites, obligatoire pour tous les citoyens âgés de moins de 60 ans. Cette caisse s'alimente d'un versement annuel de 20 francs supporté, moitié par le patron et moitié par l'ouvrier. Les communes ne prennent ces frais à leur charge que pendant la durée du service militaire ou en cas d'impossibilité de la part du travailleur. En outre, une caisse servant des retraites proportionnelles, en cas d'invalidité, trouve ses ressources dans les dons et legs et dans une taxe annuelle de 20 francs, versée par les patrons pour chaque ouvrier étranger. Les fonds de la caisse, employés exclusivement en achats de rentes sur l'État, doivent servir au complet amortissement de la dette publique.

Dans une proposition récente Monsieur Gellé propose la création d'une caisse de retraites pour tous les travailleurs.

L'âge, pour avoir droit à la pension, est fixé à 65 ans, et les ressources proviennent d'une retenue de 5 % sur les salaires, versée obligatoirement par les patrons.

Cette proposition impose l'obligation sans donner d'autre encouragement qu'une pension servie par la commune, en cas d'invalidité, et une majoration fournie par l'État pour les retraites inférieures à 365 francs.

Cette majoration ne peut, en aucun cas, dépasser un tiers de la pension acquise à l'âge de 65 ans.

Les auteurs de ces propositions diverses nient d'ailleurs l'éfficacité d'une loi qui ne contraindrait pas à la prévoyance l'ouvrier, naturellement imprévoyant. Ils font aussi remarquer que le principe de l'obligation à été depuis longtemps mis en pratique par l'État et les grandes administrations privées, pour la constitution de leurs caisses de retraites.

Les partisans de la liberté en matière de prévoyance ne se sont pas laissés convaincre par ces arguments. Les adversaires de l'assurance obligatoire sont d'ailleurs nombreux dans notre pays, où l'on admet généralement, qu'il faut laisser à chacun la responsabilité de ses actes et que tout particulier doit être l'artisan de sa propre fortune. Et des hommes éminents, après avoir fait une étude approfondie des questions

sociales et des besoins de notre race, n'ont pas hésité à dire que le principe de l'obligation était contraire à nos tendances et à nos mœurs. Le caractère si indépendant de l'ouvrier français semble d'ailleurs exclure toute loi capable de restreindre la liberté du travailleur en le plaçant sous la tutelle de l'État. Nul doute aussi que la contrainte, dont il contesterait parfois l'utilité, ne lui soit pénible, et ne fasse le plus grand tort à son énergie et à son initiative individuelle.

En outre, une loi qui imposerait à l'ouvrier un sacrifice souvent disproportionné à ses ressources et à ses charges de famille, ne tarderait pas à devenir impopulaire et son application se heurterait à des difficultés de toutes sortes.

L'emploi exclusif des capitaux énormes de la caisse de retraites en achats de rentes destinés à l'amortissement de la dette publique (emploi préconisé dans une des propositions précédentes) créerait un danger sur lequel il convient d'insister. Le premier résultat de cet emploi serait une hausse anormale des cours, capable de jeter le désarroi sur le marché financier et de lancer l'État dans la plus inquiétante aventure. Puis, quand l'absorption des fonds publics par la caisse de retraites n'aurait plus laissé à l'État qu'une dette viagère au profit de chaque pensionné, les conversions deviendraient impossibles et la source d'importants bénéfices serait tarie à tout jamais.

Propositions encourageant l'Initiative sans créer l'Obligation.

Dans ces différentes propositions sont exprimées les idées suivantes :

Les particuliers, réduits à leurs propres ressources, semblent incapables de résoudre le problème des retraites ouvrières.

L'État, par les moyens puissants dont il dispose, aurait seul le pouvoir d'assumer la charge d'une entreprise de cette importance.

L'action de la loi ne pouvant d'ailleurs s'exercer qu'en faveur des individus qui font eux-mêmes acte de prévoyance, les versements à la Caisse des Retraites doivent être purement facultatifs.

L'État intervient : soit en imposant au patron un versement égal à celui de l'ouvrier, soit en prenant à sa charge une portion des frais nécessités par le service des pensions.

Nous allons donner un aperçu des différentes propositions de lois en insistant plus particulièrement sur le projet présenté en 1891 par le Gouvernement. Un actuaire [1] dont on ne saurait nier la compétence dans les calculs d'assurances, a fait de ce dernier projet une étude très documentée ; ses chiffres et ses statistiques donneront une idée des conséquences financières qui résulteraient de l'application d'une loi d'ordre général sur les retraites ouvrières.

Dans la proposition Bérard, le patron n'intervient pas. Toute personne qui aura versé au moins *un franc* par mois, de l'âge de 15 ans à l'âge de 60 ans, aura droit a'une pension égale à celle qu'auraient produite ses versements majorés de un douzième par la commune, de deux douzièmes par le département et de trois douzièmes par l'État.

Ces subventions cesseront quand la pension dépassera 365 francs, majorations comprises, ou quand les versements seront interrompus pendant plus de trente-six mois.

[1] Monsieur Guieysse, président de l'Institut des Actuaires Français.

L'ouvrier s'astreindrait difficilement à faire des sacrifices continus pendant quarante-cinq ans pour obtenir les médiocres encouragements prévus dans le projet précédent.

La proposition de Ramel fait appel au concours financier de l'État pour les versements à effectuer pendant le service militaire ; elle lui demande aussi de prendre à sa charge les frais de gestion de la caisse. L'ouvrier est présumé vouloir profiter des avantages de la loi, à moins qu'il ne fasse une déclaration contraire. Il verse une cotisation minima de cinq centimes par journée de travail, une contribution corrélative est imposée au patron jusqu'à concurrence d'un maximum de 10 centimes.

Ce dernier verse en outre à la caisse des retraites, pour chaque journée de travail de ses ouvriers étrangers, une somme de dix centimes destinée à bonifier les pensions et à augmenter le fonds de réserve. Les versements sont reçus à partir de l'âge de 16 ans ; pendant le mariage ils profitent par moitié aux conjoints. La pension est liquidée à l'âge choisi, entre cinquante et soixante ans et d'après le tarif de la Caisse Nationale des Retraites. Toutefois, pour toute rente atteignant un maximum de 360 francs après trente versements réguliers, le taux de capitalisation est fixé invariablement à 4%. L'application du tarif 4% est d'ailleurs garantie, par la taxe de dix centimes imposée aux patrons pour les ouvriers étrangers qu'ils occupent.

Une retraite proportionnelle est immediatement acquise, à tout travailleur réduit à une incapacité permanente de travail. Elle est bonifiée, à l'aide de ressources provenant des dons et legs, et des capitaux réservés et tombés en deshérence, de rentes servies par la caisse.

En aucune cas la pension ne peut être supérieure à 1,000 francs ; le capital constitutif est aliené au réservé.

Cette même proposition prévoit la création d'une caisse annexe de capitalisation pure ; pouvant faire aussi des assurances mixtes ou à terme-fixe.

Dans la proposition Brincard, aucune limitation n'est prévue, ni pour les ressources, ni pour la situation sociale des intéressés. L'État intervient, comme précédemment, pendant le service militaire. Les versements corrélatifs des patrons sont encore obligatoires et une taxe leur est imposée pour les ouvriers étrangers.

La pension est acquise après trente versements et à l'âge minimum de 55 ans ; si elle ne dépasse pas 600 francs elle est bonifiée par l'État. Cette bonification varie de 20% à 10% en raison inverse du montant de la pension déjà obtenue.

Une proposition de Monsieur Papelier, relative à la création d'une caisse d'épargne-retraite, témoigne d'une tendance toute particulière que nous ne saurions passer sous silence. Cette caisse a pour but d'accorder à l'ouvrier les mêmes avantages qu'une caisse d'épargne en lui permettant de retirer son argent quand il le désire ; et d'autre part de lui donner toutes les facilités pour se constituer une retraite.

La caisse est ouverte à tous les Français ; chaque année une subvention de 10 francs est ajouteé par l'État au compte de tout déposant âgé de 25 ans à 55 ans, ayant effectué une versement minimum de 12 francs. À l'âge de 55 ans toute personne, justifiant de trente versements annuels de 12 francs, aura droit aux subventions de l'État ; à condition toutefois qu'elle n'ait pas un revenu supérieur à 800 francs.

Ces différentes ressources capitalisées servent à constituer une rente à capital aliéné.

Ceux qui à 55 ans ont un revenu supérieur à 800 francs peuvent réclamer le remboursement de leurs capitaux ; mais dans ce cas, le taux de l'intérêt alloué est inférieur de 1% au taux de capitalisation des fonds déposés à la caisse.

À tout associé qui se retire avant l'âge de 55 ans, ou qui décède avant cet âge, il est retenu au profit de la masse : les intérêts des versements, plus une somme de trois francs pour chaque année d'association.

Les fonds provenant, soit de la réduction des intérêts, soit de la perte de ces intérêts et de la retenue de trois francs en cas de décès ou de retrait ; servent à bonifier les retraites des pensionnés âgés de plus de 60 ans.

Les dispositions tontinières de cette caisse sont des plus critiquables. Remarquons notamment que dans le cas de retrait des fonds, les sacrifices les plus lourds sont imposés aux plus petits déposants, par la perte des intérêts et la retenue de trois francs pour chaque année d'association.

Dans une proposition plus récente Monsieur Papelier demande à l'État une prime annuelle de 150 francs, destinée à encourager tout travailleur ayant fait acte de prévoyance pendant 25 ans et justifiant d'un revenu annuel inférieur à 360 francs. Sont considérés comme prévoyants, les membres actifs et les membres honoraires des sociétés de secours-mutuels et aussi tous ceux qui, par 25 versements annuels supérieurs à 10 francs, effectués—soit à une caisse de retraites, soit à une caisse d'épargne—se sont constitué une rente viagère.

Dans ces conditions l'État accorde une prime annuelle de 100 francs, à tout travailleur âgé de 55 ans qui a produit un travail effectif pendant vingt années et qui durant la même période a fait œuvre d'épargne ou de mutualité. L'ouvrier reçoit en outre une prime annuelle de 25 francs, fournie par la commune, et une prime égale fournie par le département. La subvention communale est accordée au travailleur né dans la commune ou y habitant depuis au moins 10 ans, à condition toutefois qu'il puisse justifier d'un travail minimum de dix ans dans cette commune ou les communes limitrophes.

La subvention départementale sera acquise sous réserve des mêmes conditions.

Dans la proposition Papelier, le patron n'intervient pas, et la contribution annuelle de l'État s'élèverait environ à 50 millions. Pour y faire face on ferait appel aux ressources suivantes bien difficiles à evaluer : produits du pari mutuel et des jeux, produits des conversions, taxes sur les ouvriers étrangers, etc.

Dans sa proposition Monsieur Papelier écarte les dangers qui résulteraient de l'accumulation d'un fonds considérable dans une caisse placée sous la garantie de l'État ; mais, le procédé qu'il emploie est contraire au principe généralement admis par les actuaires, comme condition indispensable de l'existence d'une caisse de retraites.

À savoir : que toute promesse de rente, immédiate ou différée, doit être représentée par un capital existant réellement dans la caisse.

L'augmentation constante des charges budgétaires qu'imposent à l'État les pensions civiles et militaires et de la Caisse des Invalides de la Marine, ne semble pas d'ailleurs destinée à infirmer ce principe.

Un projet de loi concernant la création d'une caisse de retraites ouvrières a été présenté au nom du Gouvernement, par Monsieur Constans, le 6 juin 1891. À moins de déclaration contraire sont inscrits d'office à cette caisse : les ouvriers, employés et métayers français dont les ressources annuelles ne dépassent pas 3,000 francs. Le patron retient sur le salaire des ouvriers qu'il occupe, une somme variant de cinq a dix centimes par journée de travail, et il est tenu de contribuer pour une somme égale, à l'épargne de son employé. Les versements sont effectués soit à la caisse des retraites ouvrières, soit à des caisses de prévoyance régulièrement autorisées.

L'État accorde une majoration des deux tiers, à ces versements, si le déposant déclare et fait certifier, au moment de la liquidation de la pension, que ses ressources annuelles sont inférieures à 3,000 francs et qu'il ne jouit pas d'un revenu annuel supérieur à 600 francs. Il faut aussi que l'intéressé ait effectué des versements réguliers depuis l'âge de 25 ans jusqu'à 55 ans, sans que les interruptions, en cas de force majeure, puissent dépasser cinq années.[1] Les déposants peuvent en outre souscrire une assurance vie-entière pour un capital variant de 500 à 1,000 francs, moyennant le paiement de trente primes annuelles. L'État prend à sa charge le tiers de ces primes.

Un fonds commun est alimenté par les dons et legs, et par une taxe de dix centimes par journée de travail, imposée à chaque patron employant des ouvriers étrangers. Il s'accroît : des sommes restées libres sur la contribution de l'État, par la liquidation des pensions supérieures à 600 francs ou au profit des déposants ayant des revenus supérieurs à 600 francs, et des bonifications de l'État non maintenues par suite d'interruptions dans les versements. Les produits annuels de ce fonds servent à liquider, par anticipation, les pensions des invalides du travail, jusqu'à concurrence de la moitié ou de la totalité de la pension, suivant que les versements auront été effectués directement ou par l'intermédiaire d'une société de prévoyance.

Les conséquences financières de ce projet seraient des plus graves ; elles sont mises en lumière dans l'intéressant rapport de Monsieur Guieysse auquel nous empruntons les chiffres suivants :

En admettant avec Monsieur Constans que, sur une population ouvrière de neuf à dix millions de personnes il y aura trois millions d'adhérents, correspondant à l'inscription annuelle et permanente de 110,000 individus âgés de 25 ans, la caisse aura son plein théorique d'adhérents (3,022,733) après 30 ans, et son plein théorique de retraités âgés de plus de 55 ans (1,500,790) après 78 ans. (On néglige les inscriptions de 25 à 40 ans dont l'action n'est que temporaire.)

L'hypothèse d'un versement de quinze centimes par jour pendant 290 jours, soit 43 fr. 50 c. par an, supporté moitié par l'ouvrier et moitié par le patron, crée à l'État une charge annuelle égale aux deux tiers de cette somme, soit 29 francs.

La caisse de retraites recevra en moyenne pour chaque adhérent 72 fr. 50 c., donnant droit, à 55 ans, à une rente viagère de 450 francs ou 390 francs, suivant que le taux est de 4% ou de 3½%.

L'annuité versée à la caisse au moment du plein sera de 219,148,142

[1] La rente provenant de la subvention de l'Etat, cumulée avec les autres revenus du déposant, ne doit pas dépasser 600 francs.

francs, et avec les dispositions accessoires du projet on peut évaluer à cent millions, en chiffres ronds, la charge annuelle imposée à l'État.

En tenant compte des assurances en cas de décès, la caisse aurait accumulé un capital d'environ douze milliards, à la fin de la 78ème année, époque à partir de laquelle le nombre des rentiers serait théoriquement invariable. Le service des pensions, fixées à 450 francs, nécessiterait une annuité de 675,436,500 francs; et le capital assuré serait de 1,600,000,000 francs, correspondant à une somme moyenne de 500 francs payable au décès.

Ces chiffres sont établis au taux de 4%; pour un taux inférieur, ou bien la rente devra être réduite, ou une contribution complémentaire deviendra nécessaire.

Monsieur Constans a reconnu l'exactitude de ces chiffres, et il n'a pas contesté qu'avec la baisse probable du taux de l'intérêt, la caisse ne soit amenée à faire valoir, après 77 ans, un capital de 16 milliards, si le montant de la rente est fixé à 450 francs.

Ces évaluations ne sont évidemment que très approximatives, puisque la caisse est facultative et par suite le nombre des adhérents absolument indéterminé; elles suffisent néanmoins à justifier les plus sérieuses inquiétudes. Ne semble-t-il pas que la capitalisation de sommes dépassant l'énorme chiffre de 12 milliards ne soit presque impossible à réaliser? Ne semble-t-il pas, comme l'a dit Monsieur Guieysse, " que de pareilles " sommes jetées, même progressivement, sur le marché, ne tarderaient " pas à l'écraser, en faisant caisser rapidement le taux des placements et " surélevant le cours des rentes et de toutes les valeurs qui y sont liées? "

On a prévu aussi des difficultés nombreuses, en ce qui concerne les dispositions générales du projet. Les ressources annuelles des adhérents semblent difficiles à vérifier; le versement corrélatif imposé au patron pourra l'entraîner à diminuer les salaires ou à n'employer que des ouvriers n'ayant pas adhéré à la caisse.

On a critiqué également les clauses de déchéance qui rendraient souvent illusoires les majorations de l'État.

La première proposition Guieysse prévoit la création d'une caisse nationale de retraites au profit de tous les travailleurs, et de caisses régionales, dépendant de la première, chargées de l'emploi des capitaux recueillis dans la région, en fonds d'État français, en prêts communaux, ou en placements industriels, agricoles ou commerciaux.

L'inscription à la caisse n'est opérée que sur la demande de l'ouvrier et la pension ne peut être liquidée avant l'âge de 50 ans; son maximum est fixé à 600 francs. Les versements faits par les adhérents, sont applicables à une forme quelconque de l'assurance sur la vie. La subvention de l'État, égale au montant des versements, ne peut dépasser 30 francs par an; elle cesse quand son montant total atteint mille francs. Des contributions patronales, variant de 2 à 6 francs pour les agriculteurs, et de 3 à 9 francs pour les autres patrons, sont versées à la caisse pour 300 jours de travail utilisés.

Pour les ouvriers étrangers cette contribution est doublée; elle doit servir à constituer une caisse d'invalidité.

Enfin dans une proposition toute récente (18 décembre 1897), Monsieur Guieysse n'appelle, au bénéfice de sa caisse de retraites, que les ouvriers de l'industrie (2,700,000 environ). Les ressources sont fournies par un versement de 4% des salaires, supporté pour moitié par

le patron. L'État n'intervient que pour un versement viager égal à la pension acquise au moment de la liquidation, c'est à dire à soixante ans.

Cet exposé succinct des différentes propositions de lois, peut donner une idée de la diversité des opinions qui se manifestent en France, dans la question des retraites ouvrières. La division même de notre étude nous a d'ailleurs permis de constater d'abord trois tendances générales.

La première conduit à admettre que tout vieillard indigent a droit à une pension de retraite ; même sans avoir fait acte de prévoyance. Les propositions qui s'en inspirent tendent simplement à créer un nouveau chapitre au budget de l'assistance publique.

Une deuxième tendance amène à supposer que l'ouvrier est incapable d'avoir lui-même le souci de son avenir ; elle conduit à l'assurance obligatoire.

Les dernières propositions que nous avons examinées, témoignent d'une troisième tendance. Elles sont en effet basées sur la liberté et sur l'effort personnel, au moins en ce qui concerne l'ouvrier ; l'action de l'État ne s'exerce que par une coopération effective à l'œuvre de prévoyance individuelle.

Nous avons d'ailleurs signalé les objections nombreuses opposées à ces divers projets et les graves difficultés financières qui résulteraient de leur adoption.

Il nous reste à parler maintenant, d'une quatrième tendance commune à un grand nombre de nos compatriotes, et qui consiste à chercher en dehors de l'État, la solution de la question des retraites ouvrières. Monsieur Paul Leroy-Beaulieu, dans une critique très vive de différents projets de lois, s'élève notamment contre une nouvelle conception de l'État qu'il considère comme erronée, chimérique et funeste ; à savoir : " que la collectivité est tenue de procurer le bonheur universel."

En présence des remarquables résultats obtenus par les institutions libres de prévoyance, on a considéré que la preuve de l'impuissance de l'initiative privée n'était pas encore faite.

Une loi générale, s'appliquant sans distinction à toutes les catégories de travailleurs, a semblé présenter quelques dangers ; parcequ'elle ne saurait tenir suffisamment compte des besoins de chacun ; besoins qui varient suivant les lieux et suivant les professions. Et encore parcequ'elle pourrait porter un coup funeste aux caisses patronales qui accordent le plus souvent aux salariés des avantages bien supérieurs à ceux que la loi leur promet.

Les partisans de la liberté en matière de prévoyance sont d'ailleurs loin d'admettre que tout est pour le mieux. Mais ils voudraient que le rôle de l'État se bornât : à encourager et à stimuler l'initiative privée sans l'enchaîner dans une formule spéciale et sans prendre des engagements peut être impossibles à tenir.

Ils désireraient aussi que l'État donnât des encouragements à la prévoyance, sans distinguer les caisses patronales des caisses officielles dont la gestion lui serait pénible et onéreuse.

Ils souhaitent enfin, que par un large développement de l'esprit de prévoyance et d'initiative individuelle, on arrive à résoudre sans secousses la question des retraites ouvrières.

Translation.

Old Age Pensions in France. By H. Duplaix, *Actuary of La Compagnie d'Assurances Générales sur la Vie, Paris.*

In its first portion, this Paper consists of:

(1) A brief examination of the conditions of the working of our Old Age Pension Fund, established by the State.
(2) An analysis of the different laws which apply either generally to employers' Pension Funds for the benefit of working men and clerks, or more particularly to the Pension Funds of railway companies and mining industries.

Lest our Paper should duplicate that of one of our colleagues, we do not propose to examine the working of the Pension Funds of friendly societies. These societies, moreover, most frequently give life pensions only in so far as their available resources permit. These eventual pensions are provided by Pension Funds deposited at the Caisse des Dépôts et Consignations. This institution was established by decree, 26 April 1856. Let it be noticed, also, that the amounts of these pensions are usually much less than the pensions provided by the employers' Funds. Finally, to give an idea of the tendencies which have been manifested in France on the question of pensions to workmen, we very briefly analyse in the second part of this Paper the different Bills submitted to Parliament during the past few years.

National Old Age Pension Fund.

This Fund was established by the law of 18 June 1850, in order to place at the service of the economical and thrifty worker a suitable institution to receive and accumulate his savings, made for the purpose of providing a retiring pension. Guaranteed by the State, conducted by the Caisse des Dépôts et Consignations,* this fund is actually administered under the law of 20 July 1886.

The rate of interest allowed to the depositors varied from 5 per-cent to 4½ per-cent from the year 1850 to 1882. This guaranteeing of a rate of interest above that obtainable from the public funds had, for result, the encouragement of speculation, and the creation in the Fund of deficits which did not amount to less than 75,000,000 francs in the seven years 1875—1882.

Now the rate of interest, graduated by quarter-francs, is fixed by annual decree. The old investments, and other profitable ones in

* Since 1 January 1891, the working expenses of the National Pensions Fund are repaid by that Fund to the Caisse des Dépôts et Consignations.

departmental and communal bonds,* have enabled the rate of interest to be kept up since 1891, at 3 francs 50 centimes per-cent (corresponding to an annual rate of 3·546 per-cent).

The moneys of this Fund are invested in the National Debt, in Treasury bonds, or bonds guaranteed by the Treasury, or, likewise, in departmental and communal bonds.

Since 1887, the mortality table CR., prepared from the statistics of the Fund itself, has been employed, instead of that of Deparcieux, which had been adopted in the first instance.

The payments made during any one year to the account of a single person must not exceed 500 francs (except as regards the payment made by Friendly Societies or by Miners' Pension Funds). These payments are received either with or without return. Payments made during marriage are for the benefit separately, and in equal proportions, of the married partners.

The Fund does not grant annuities on joint-lives. There is evidently, here, a shortcoming which the preceding clause does not make good, because that necessitates at the first death a serious reduction in the amount of the pension.

The amount of the pension may not in any case be greater than 1,200 francs. The date of entry into the pension is fixed, as the depositor may choose, at any age from 50 to 65. In case of injuries or infirmities, resulting in absolute incapacity to work, the pension may be anticipated; it is calculated according to the payments already made, and may be supplemented by a credit provided in each year's Budget. (In 1896 this credit amounted to 15,000 francs. It was augmented by half the proceeds of the sale of crown jewels, applicable under the name of a special endowment for the purpose of such allowance.)† The amount of such supplemented pensions must not be more than three times the amount of the bonus, or exceed a maximum of 360 francs.

The pensions granted by the National Pension Fund are inalienable and unattachable up to the amount of 360 francs.

Lastly, under the law of 31 December 1895, the sum of 2,000,000 francs was in 1896 paid into the National Fund to provide an increase of all current pensions to all those aged at least 70 years who had not a personal income (for life or not) above 360 francs. This increase, moreover, was only given to those who had during a certain number of years persevered in some act of thrift, either by paying into an old age Pension Fund, or by payments to a Friendly Society.

Among the payments made to the National Pension Fund there must be distinguished (1) Those made by associated bodies, such as railway companies, miners' societies, friendly societies, employers, &c. (2) Those made by single individuals.

The number of the first has more than doubled during the last five years, whilst that of the second has only increased by 15 per-cent.

There can be gathered from the following table the comparative amounts of the payments by associated bodies and individuals from the years 1892 to 1896.

[*For Table, see p.* 791.]

* Nevertheless, in 1896, the net interest on loans to Communes and Departments did not amount to more than 3·55 per-cent. In the same year, the net return on the whole of the investments was 3·76 per-cent.

† Law of 31 December 1895.

We here give for the same years the proportion of the members affiliated by associated bodies—84·04 per-cent in 1892; 91·79 per-cent in 1893; 87·59 per-cent in 1894; 96·38 per-cent in 1895; and 94·01 per-cent in 1896.

The sums paid by the P. L. M. Railway Company for its staff explains in part the increase in the years 1892 and 1893. The increase in the following years arises from the operation of the law of 29 June 1894, relating to the mining industry.

Although the average of the collective payments (17 francs in 1896) is much below the individual payments (204 francs in 1896) the associated bodies are nevertheless the much more important clients of the National Old Age Pension Fund.

It should be observed, finally, that the payments made on behalf of the Pension Funds of friendly societies are diminishing, notwithstanding the bonus allowed on these payments by the Minister of the Interior. Friendly societies have also a tendency to work the Pension Funds themselves with the help of the 4½ per-cent interest allowed them on their deposits.

Employers' Funds.

In France Pension Funds for the benefit of workmen and clerks have increased very much during the last few years.

The example set first by the State, by friendly societies, and by the railway companies, has had the happy effect of leading on many private industrial and administrative concerns to most generous efforts.

Although statistics are not yet available to show the exact number of Employers' Funds, rapid development seems to us to be indisputable.* On every side, in commerce and in manufactures, Funds have been established and endowed by employers anxious to secure a pension for their workmen. Most frequently, also, these institutions have not been slow in creating close ties of co-operation, and sometimes even of affection, between the employer and the employed.

The workmen avoid strikes, and make a more durable and regular effort, and interest themselves in a more intimate way in the success of the firm, when the safety of their declining years depends on its success.

The agreements which are drawn up between employers, workmen, and clerks, in the founding of special Pension Funds are numerous and varied. The rules of these Funds are prepared according to the most diverse ideas. Some are established on the basis of pure generosity. Others require from the members payments equal to those of the employers. Some of them provide themselves the pensions, whilst others purchase them from the National Old Age Pension Fund by means of individual certificates.

By the law of 27 December 1895 the investment of the moneys of Employers' Funds is restricted to Government Securities, Departmental or Communal Bonds, Bonds of the Treasury, or guaranteed by the

* Since the above was written, the Labour Department has published the very interesting results of an enquiry into the Employers' Pension Funds of the establishments subject to the inspection of the Department.

Treasury, or land mortgage or Communal Bonds of the Credit Foncier, and Bonds issued by institutions of recognized public use.

Moreover, the deductions from wages and the sums which the employers promise or engage to provide for the purpose of assuring retiring pensions must be paid in either to the National Pension Fund to the account of each individual member, or to the Caisse des Depôts et Consignations, or, lastly, to a Syndicate Fund or Employers' Fund, authorized by decree and subject to the supervision of their finances.

The same law also gives the right to the workmen to claim, in case of failure or judicial liquidation, the repayment of all moneys paid into the Fund and not employed according to the rules. In case of voluntary assignment the right of repayment remains the same, unless the assignee consents to take the place of the assignor.

An administrative order, published on 14 October 1897, has moreover fixed the basis of the calculations to determine the value of the rights actually acquired or still prospective of members of the Pension Fund in case of bankruptcy.

The law of 27 October 1895 has created in favour of the workmen a guarantee, of which the advantage cannot be disputed; but the intervention of the State has unsettled the minds of the employers and diminished the tendency towards the creation of new employers' societies.

Funds Regulated by Special Laws.

The law of 27 December 1895 applies to all Pension Funds, and does not make any distinction between them. Nevertheless the Pension Funds for mines, and those of railway companies and friendly societies are regulated by special laws. Let it be noticed also that the special Funds of certain establishments, depending more or less on the State, have been organized under Ministerial decrees or orders. For example, there can be mentioned the Pension Fund of the employees of the Mont de Piété (decree 23 July 1882), the Pension Fund of the National Schools of workmen, foremen, and apprentices (order 25 February 1892), and the Pension Fund of the employees of the State railways (decree 13 January 1883).*

Miners' Pension Funds.

The obligation to establish Pension Funds has been imposed by law (29 June 1894) on those who work mines and on their workmen.

The employer pays each month, either to the National Old Age Pension Fund, or to a Syndicate or Employers' Fund authorized by decree and subjected to State control, a sum equal to 4 per-cent of the wages of the workmen. Half the payment is deducted from the wages, the other half is provided by the employer. The workmen and clerks are only allowed to benefit by this law up to a salary of 2,400 francs.† The payments are entered upon an individual

* This Fund was paying on 31 December 1895 pensions to the amount of 54,028 francs to 158 pensioners, giving an average of 341·95 francs per pension. It is supported by the deduction of the first month's wages, a deduction of 5 per-cent from the wages, and a subvention by the State equal to 10 per-cent (since 1 January 1896).

† Contributions are compulsory up to 55 years of age. After that age they are optional.

certificate in the name of each workman or clerk, and the pension is paid on the basis of calculations adopted by the National Pension Fund. The entry on the pension, fixed at age 55, can be deferred at the request of the beneficiary, and a return of contributions is only permitted in respect of that portion deducted from the wages.

The application of the law regarding pensions to miners, only came completely into force during 1896. During that year the number of payments made by mining firms was 400,158, corresponding to a total sum of 3,400,619·31 francs.

It may, perhaps, not be uninteresting to add that, previous to the law of 1894, almost all the mining employers had established on behalf of their workmen Pension Funds administered often in a most liberal spirit.

Railway Pension Funds.

The law of December 1890 requires a Ministerial confirmation of the deed of settlement and rules of the Pension Funds and Friendly Societies of railway companies. Under this law the rules of the greater number of companies have been revised and submitted for confirmation.

The various papers submitted by the companies to support their requests seemed insufficient to make valuations of the resources and liabilities respectively, and on 28 February 1894 the Consultative Committee issued the following notice:

"Before confirming the deeds of settlement and rules it is "necessary to require the different companies to provide:

"(1) Within four months, the statistical materials and the "calculations necessary to compute the annual charges "intended to secure the normal working of the pensions.

"(2) Within one year the documents necessary to determine the "liabilities which have arisen in consequence of the "insufficiency of previous contributions.

"(3) To have these documents verified by an audit."

Since that time, very interesting statistics have been furnished by different companies, notably by the Compagnie de l'Ouest, which has entrusted to the eminent actuary, M. Lament, the duty of making the calculations relating to its Pension Fund.

Nevertheless, up to now no collective work has been published on the figures supplied by the great railway companies, and it has not been possible to confirm any rules.

Results will, no doubt, not be long delayed, now that the abundance of documents already collected will enable the Committee to decide upon the trustworthiness of the only valuation data which the companies could supply: for instance, the average duration of service; the average age of entering on the pension; the proportionate number of married employees; the average salaries, &c.

At the beginning, membership of the Pension Funds of the railway companies was optional, the companies confining themselves to making a payment equal to that which the clerk had freely agreed to, generally 3 per-cent or 4 per-cent on his salary.

The pension, secured either at the National Fund or by means of special Funds, was fixed at the time of its being entered upon, according to the payment actually made.

According to the rules now actually in force, the principle is very different. The deduction from salary is compulsory, and the company undertakes to provide a pension about equal to one-half the average salary of the last six years of service.

The annuity is most frequently, also, continued to the widows and orphans.

The conditions requisite for receiving the retiring pension are generally the following: To be 55 years of age and to have had 25 years service, during which a deduction from salary was made (except in the case of serious infirmity, giving right to an earlier pension).

These rules have had, for effect, to increase constantly the number of members of the Pension Funds, and to create charges pressing more and more heavily on the companies. This can be seen from the following figures, which we take from the interesting report of M. Chanchat.

For the six companies (Est, État, Lyon, Midi, Orléans, Ouest) the total number of employees, members of Pension Funds, amounted to 79,189 in 1875; 120,512 in 1882; 167,535 in 1892.

To provide the pensions, annuities for the following amounts had to be set up, namely, 15,135,882 francs in 1888; 15,632,997 francs in 1890; 25,217,177 francs in 1892.

The cost which arises from the rapid growth of the amount of the pensions, is still further increased by the fact of the constant fall in the rate of interest. The companies are, thereby, obliged to increase to a large extent the payments to the Pension Funds. Let us take some examples:

The Pension Fund of the P.L.M.

In 1889, the deductions from salary were 4 per-cent, and the amount paid by the company 6 per-cent.

In 1894, the deductions from salary were 4 per-cent, and the amount paid by the company 8 per-cent.

This company expects, moreover, that the amount of its annual subsidies will amount to 14 per-cent or 16 per-cent, to secure the solvency of the Fund.

The Pension Fund of the Compagnie du Nord.

In 1889, the deductions from salary were 3 per-cent, and the amount paid by the company 3 per-cent.

In 1894, the deductions from salary were 3 per-cent, and the amount paid by the company 9 per-cent.

The Pension Fund of the Compagnie de l'Ouest.

In 1889, the deductions from salary were 4·2 per-cent, and the amount paid by the company 5·2 per-cent.

In 1894, the deductions from salary were 4·2 per-cent, and the amount paid by the company 8·2 per-cent.

The number of members, and the cost to the companies, have been still further considerably increased during the last few years.

The railway companies have tried to provide against the probable further fall in the rate of interest, by paying into the National Pension

Fund to the individual account of each new employee, each year, the whole or part of the annual contributions. The Nord and Ouest Companies pay to this Fund the amount deducted from salaries. The syndicate of the Chemins de Fer de Ceinture, pays in the whole of the contributions to provide for its employees individual certificates.

The system of individual certificates paid for by the deductions from the salaries and the grants by the companies, is being adopted generally. By this system, the companies free themselves from the working, sometimes troublesome, of their Pension Funds, and also of the uncertainty of the liabilities which they assume.* They hope, moreover, that the premium given to length of service will enable them to retain their employees who have by that length of service acquired valuable experience.

The Company P.L.M. has already followed that tendency in the establishment of a Pension Fund, started in April 1892, for the benefit of the clerks on its staff. A deduction of 4 per-cent from the salary, and a grant by the company, increasing from 4 per-cent up to 6 per-cent, according to duration of service, provides at the National Pension Fund an individual certificate, which is the property of the clerk. According to a second plan, the company guarantees to every clerk of 25 years' service and 55 years of age (or only 15 years' service, without the limit of age, in case of injury) a retiring allowance of 4 per-cent for each year of service.

We make the following additional remarks: The National Pension Fund does not accept annual payments above 500 francs, and the amount of pension assured on any one life cannot be more than 1,200 francs. Therefore, the railway companies are obliged to retain, in part, the cost of the pensions allowed to clerks with large salaries.

Moreover, under the rules of the National Pension Fund, the payments made during marriage benefit separately, to the extent of half each, the two married partners. This results in the reduction of the annuity at the first death. This reduction does not fall in with the principle generally accepted in the railway Pension Funds, namely, that the annuity must run undiminished up to the death of the husband.

The following table shows the payments made in 1896 by the different railway companies to the National Pension Fund.

[*For Table, see page* 796.]

Proposed New Laws.

In the last two sittings of the French Parliament, numerous proposals regarding the formation of a National Pension Fund for workers were brought forward. The public Services, under Minister Constans, themselves took the initiative in a project for which urgency was declared.

Referred to various commissions, these projects met with very serious objections, and not one of them has yet been able to come to anything. Specialists on such matters, moreover, took part, either in the House or in newspapers and special pamphlets, in most interesting

*They thus gain considerably by the unduly low rates of the National Pension Fund.

discussions, both on the theoretical value of the proposed solutions, and on the general principles of the plans.

Actuaries pointed out numerous errors in the calculations, which were seldom in conformity with the data of actuarial science. The statistics seemed to them to be frequently untrustworthy and inexact.

Sometimes they showed also that the equation was more apparent than real between the actual resources and the ultimate liabilities.

Some have regretted that there has been retained, in the majority of proposals, the principle of annuities with return of contributions, a principle which leads to marked diminution in the pension, to give the right to an insignificant return of capital if death occurs in early years; or to a more important return, but of which the utility is subject to doubt, if death occurs in old age, when family expenses are generally lighter, if, in fact, they have not altogether disappeared.

Others, lastly, would have wished to separate more distinctly old age pensions from invalid pensions, and also not to reduce below 65 the age at which the pension should be claimable.

Economists, also, were troubled by the thought of the accumulation in the Fund of capital amounting to milliards, an accumulation which is the fatal result of most of the schemes.*

They fear, from this fact, a most serious disturbance in the money market, and a fall in the rate of interest, involving in the future quite incalculable charges. These same economists are also troubled by the demand made by some of these projects for taxes and levies calculated to upset completely the distribution of wealth. There are also many others who see in a new codification of the law, bringing the Pension Funds under more or less narrow rules, a system calculated to check the development of special Funds which frequently solve the problem of old age pensions by the most ingenious and varied methods.

The brief analysis which we propose to make here of these various proposals, and of the objections which they have met with in our country, will, moreover, permit everyone to realize the various tendencies manifested in France as to the question of workmen's pensions.

We shall distinguish amongst these schemes:

(1) Those which derive their resources solely from taxation;
(2) Those which impose on the workmen compulsory pensions;
(3) Those which encourage individual effort without coercion.

Proposals based upon Taxation.

In this category are to be found the proposals of Messrs. Laisant, Lacôte, Chassaing, and Chantemps.

In the proposal of M. Laisant, the Fund is maintained by levies, fixed at five centimes for each working day, demanded from the employer, and a like contribution for each foreign workman in his employ. To these sources of income are added customs duties on articles of food of first necessity. A minimum pension of 500 francs is provided, in so far as the available resources permit, to men aged more than 60 years, beginning with the oldest.

* According to a report of Mons. Guieysse, when the Government plan should reach a stationary condition, it would have accumulations of twelve milliards.

In the Pension Fund proposed by M. Lacôte, a pension of 500 francs is payable to every Frenchman, rich or poor, aged at least 60 years. The Fund is maintained by an annual payment of 150,000,000 francs, provided, one half by the State, the other half by a subsidiary temporary Fund, the formation of which is at the same time arranged for. The resources are derived from a contribution varying from one to two working days, according to the amount of wages, and from taxes on bachelors and foreign workmen. The accumulations of the Fund are to be applied to liquidate the public debt.

M. Chassaing intends that his Fund shall be immediate, universal, and free of cost, to all Frenchmen who shall prove themselves to have an income less than the amount of the pension fixed by law, and varying from 300 to 800 francs according to the place of birth. The necessary income to provide the pension is secured by the abolition of the hereditary right of collaterals, and by graduated taxation which varies from 1 per-cent to 75 per-cent on inheritances in the direct line, and on gifts between living people.

The proposal of M. Chantemps equally provides its resources from succession duties. The pension comes into possession at 60 years of age, and the amount is fixed by the Municipal Council, either of the Commune in which the applicant was born, or the Commune which he last inhabited. The State pays to the Communes half the sum necessary to provide the pensions.

In M. Jouffroy's proposal, the pension varies according to the Commune from 200 to 500 francs, and is payable to everyone unable to provide for his own necessities. The cost is borne one-fourth by the Commune, one-fourth by the Department, and one-half by the State. New duties imposed on successions and on employers maintain the Fund.

To these proposals may be added that of M. Emile Rey, intended to provide a portion for the benefit of indigent children. The capital sum to be paid at majority is fixed at from 500 to 1,000 francs, of which one-fourth is to be applied to set up an old age pension.

These different proposals have provoked most active criticism. It has been specially alleged against them that they will

(1) Create confusion between public assistance and thrift, in admitting that poverty gives a right to a retiring pension;
(2) Discourage initiative and individual effort, by placing the thrifty and laborious workman in the same position as the idle and improvident; and even giving in practice a privileged position to the latter, who most frequently has been reduced by his own misconduct to that poverty which entitles him to the benefit of the law;
(3) Rely upon resources, difficult if not impossible to value, with the immediate result of weighting heavily the State, the Commune, and the individual.

Moreover, it has been held that duties, amounting up to 75 per-cent on successions in the direct line, will deal a heavy blow at private property; and the customs duties suggested in the first proposal would impose heavy charges on large families who would suffer more than others from indirect taxation.

We must also speak with the greatest hesitation on the technical soundness of these projects. The amount of the pension is generally

fixed in the most arbitrary manner, and the estimates of the number of pensioners, and of the resources intended to maintain the Pension Funds, are arrived at by methods which may very well be called in question.

Proposals for Compulsory Pensions.

The authors of these plans appear to have been inspired by the German law.

In the proposals of Messrs. Isambard and Goujon, contribution to the Pension Fund is compulsory from the 15th to the 60th year for workpeople of both sexes, and for clerks whose salaries are less than 3,000 francs. For others it is optional.

Employers are required to pay into the Fund the sum of 10 centimes, deducted each day from the wages of every French workman, and a like sum for every foreign workman whom they employ.

The payments in respect of each year corresponding to 300 days of actual work, give a right to a pension of 13·34 francs to commence at the age of 60. In case of illness entailing a complete incapacity for work, a pension proportionate to the payments made is acquired, no matter what the age may be.

The victim of an accident due to his work has a right to a pension of from 500 to 800 francs.

According to the calculations of Messrs. Isambard and Goujon, the annual charge for the pensions would amount to a milliard and one half at the time of the full working of the fund.

M. Michelin proposes to allow an annual immediate pension of 365 francs to each invalid, and to each poor person aged more than 60 years.

At the date of the publication of the law the provision of these pensions would be secured by subventions drawn by the Commune from capital, and from the poor law revenues, and by taxes on riches.

M. Michelin proposes, also, the formation of a Pension Fund obligatory to all citizens of less than 60 years. This Fund would be maintained by an annual payment of 20 francs, made one-half by the employer and one-half by the workman. The Commune would only meet these payments during the time of military service, or in case of the total inability of the worker to provide his quota. In addition, a Fund providing a proportionate pension in case of illness would be maintained by gifts and legacies, and by an annual tax of 20 francs, paid by the employer for each foreign workman in his service. The accumulations of the Fund employed exclusively in the purchase of the public debt would result in the complete liquidation of that debt.

In a recent proposal, M. Gillé proposes the formation of a Pension Fund for all workers.

The age for entry upon the pension is fixed at 65 years, and the income is provided by a deduction of 5 per-cent from the wages, paid compulsorily by the employers.

This proposal, moreover, imposes compulsion without providing any other encouragement than a pension borne by the Commune in case of illness, and an increase provided by the State for pensions of less than 365 francs.

This increase, moreover, can in no case exceed one-third of the pension acquired at the age of 65.

The authors of these diverse schemes, moreover, deny the efficiency of a law which would not compel thrift in the workman naturally thriftless. They also point out that the principle of compulsion has been for a long time in practical operation by the State and great private firms for the formation of their Pension Funds.

The advocates of liberty in the matter of thrift have not allowed themselves to be convinced by these arguments. The opponents of compulsory assurance are moreover numerous in our country, where it is generally admitted that to each one must be left the responsibility for his own actions, and that each one must be the architect of his own fortune. And eminent men, after having deeply studied social questions and the needs of our race, have not hesitated to say that the principle of compulsion is contrary to our tendencies and our habits. The independent character of the French workman seems, moreover, to render impossible all laws having a tendency to fetter the liberty of the workman by placing him under the guardianship of the State. No doubt also, such restraint, of which he would dispute the benefit, would be irksome to him, and would do the greatest injury to his energy and to individual effort.

Besides, a law which would impose on the workman a sacrifice, often disproportionate to his circumstances and to the cost of maintaining his family, would not be long in becoming unpopular, and its enforcement would meet with difficulties on all hands.

The investment of the enormous accumulations of the Pension Fund exclusively in the purchase of Government securities with a view to the liquidation of the public debt (such investment being extolled in one of the foregoing proposals) would create a danger on which it is desirable to dilate. The first result of such investment would be the abnormal raising of the market price calculated to disorganize the the money market and to involve the State in the most anxious speculations. Then, since the absorption of the public debt by the Pension Fund would leave to the State only a debt consisting of life annuities for the benefit of each individual pensioner, conversions would become impossible and a source of substantial profits would be postponed for all time.

Proposals Encouraging Individual Effort Without Compulsion.

In these various proposals the following ideas are embodied:

Individuals left to their own resources seem incapable of solving the problem of workmen's pensions.

The State, by the powerful means at its disposal, is alone capable of assuming the responsibility of an enterprise of such magnitude.

The action of the law being, moreover, capable of working only in favour of those who themselves perform some act of thrift, subscription to the Pension Fund must be entirely optional.

The State intervenes, either by imposing on the employer a charge equal to that of the workman, or by itself accepting part of the cost necessary for providing the pension.

We shall here give a short statement of the different laws suggested, giving the greater prominence to that submitted in 1891

by the Government. An actuary* whose competence in life assurance calculations no one will deny, has made a detailed examination of this last proposal, and his figures and estimates will give a good idea of the financial effects which would follow the application of a general law on the subject of workmen's pensions.

In the proposal of M. Bérard the employer does not intervene. Everyone who shall have paid at least one franc per month from age 15 to 60 shall have the right to a pension equal to that provided by his own payments, increased by one-twelfth by the Commune, two-twelfths by the Department, and three-twelfths by the State.

These subventions are to cease when the pension exceeds 365 francs, including the additions, or when the payments shall have been suspended for more than 36 months.

The workmen would only with difficulty make these continuous sacrifices during 45 years to obtain the very moderate encouragement intended in the last-named proposal.

The proposal of M. Ramel appeals to the financial assistance of the State for the payments to be made during the time of military service. It also asks the State to undertake the working expenses of the fund. The workman is presumed to intend to take advantage of the law, unless he makes a statement to the contrary. He makes a minimum contribution of 5 centimes per working-day, and a corresponding contribution is imposed on the employer, up to a maximum of 10 centimes.

The latter pays in addition to the Pension Fund for each working-day for all foreign workmen the sum of 10 centimes, intended to increase the pensions and to augment the reserve fund. The payments are made starting from the age of 16. During marriage they are applied for the benefit of the married partners in equal shares. The pension is entered upon at a selected age between 50 and 60 years, and according to the table of rates of the National Pension Fund. However, when a pension reaches the maximum of 360 francs after 30 regular payments, the rate of accumulation is fixed absolutely at 4 per-cent. The application of the 4 per-cent rate is, moreover, guaranteed by the tax of 10 centimes imposed on the employers for foreign workmen in their employ.

A proportionate pension is immediately entered upon by all workmen rendered permanently totally incapable of work. It is provided by the help of resources arising from gifts and legacies and from unclaimed contributions to the Fund on the returnable scale which have become forfeited.

In no case can the pension be more than 1,000 francs, and the contributions are with and without return.

The same proposal provides for the creation of an auxiliary Fund for simple accumulation of money, and capable also of granting endowment assurances or assurances for fixed terms.

In the proposal of M. Brincard no limitation is imposed, either on account of the income, or of the social status of those concerned. The State intervenes as before during times of military service. The corresponding payments of employers are still compulsory, and a tax is levied upon them for foreign workmen.

* Mons. Guieysse, President of the Institute of French Actuaries.

The pension is entered upon after 30 years' payment, and the minimum age is 55 years. If the pension does not exceed 600 francs it is augmented by the State. This augmentation varies from 20 per-cent to 10 per-cent, in inverse ratio to the amount of pension already secured.

The proposal of M. Papelier, relative tot he formation of a Savings and Pension Fund, bears witness to a very special tendency which we cannot pass over in silence. This Fund has for object to grant to the workman the same advantages as a savings bank, in allowing him to withdraw his money if he wishes; on the other hand, to afford him every facility to secure a pension. The Fund is open to all Frenchmen. Each year a subvention of 10 francs is added by the State to the account of every depositor from 25 to 55 years of age, who has made a minimum payment of 12 francs. At the age of 55, everyone who has made 30 annual payments of 12 francs, is to have the right of the State subventions, provided always that he has not an income of more than 800 francs.

These different resources capitalized serve to set up an annuity without return of contributions.

Those who at 55 have an income of more than 800 francs, can demand a return of contributions; but in that case, the rate of interest allowed is less by one per-cent than the rate of accumulation of the moneys deposited in the Fund.

Of every member who withdraws before the age of 55, or who dies before that age, there is retained for the benefit of all the members the interest on the payments, together with the sum of 3 francs for each year of membership.

The surpluses arising, either from the deduction from the interest, or from the loss of all interest and the retention of 3 francs in case of death or withdrawal, are used to increase the pensions of those aged more than 60 years. The tontine-like arrangements of this fund are open to serious criticism. Let it be noticed specially that in case of withdrawal of the contributions, the heaviest sacrifices are incurred by the smallest depositors, through the loss of interest and the retention of 3 francs for each year of membership.

In a more recent proposal, M. Papelier asks of the State an annual subsidy of 150 francs, intended to encourage all workmen who have performed some act of saving for 25 years and possess an annual income of less than 360 francs. They are considered as thrifty who are benefit members or honorary members of a friendly society, and also all those who by 25 annual payments exceeding 10 francs, either to a pension fund or a savings bank, have provided for themselves a life annuity.

Under these conditions, the State is to grant a subsidy of 100 francs to every worker aged 55 years, who has been actively employed during 20 years, and who throughout that period has given evidence of thrift or subscribed to a friendly society. The workman receives besides an annual subsidy of 25 francs provided by the Commune, and a subsidy of equal amount provided by the Department. The communal subsidy is to be granted to the workman born in the Commune, or who has worked there for at least 10 years, on condition always that he can show that he has worked at least 10 years in that Commune, or in those bordering upon it. The departmental subsidy is to be acquired on the same conditions.

In the proposal of M. Papelier the employer does not intervene, and the annual amount of contributions by the State will reach about 50,000,000 francs. To meet this charge, recourse would be had to the following resources, very difficult to value, namely, a tax on betting, and on games, the product on conversions, taxes on foreign workmen, &c.

In the proposal of M. Papelier the dangers are escaped which arise from large accumulation in a Fund placed under the guarantee of the State; but the processes he adopts are contrary to the views generally accepted by actuaries as to conditions indispensable to the existence of a Pension Fund.

For instance, that all contracts for an annuity, immediate or deferred, must be represented by a capital amount actually existing in the Fund.

The constantly growing budgetary charge, imposed upon the State by the civil and military pensions and the Invalids' Pension Fund of the Navy, does not seem to weaken this principle.

A draft Bill relating to the formation of a workmen's Pension Fund was submitted on behalf of the Government by M. Constans, on 6 June 1891. Unless a declaration is made to the contrary, there are automatically entered in this Fund French workmen, clerks, and small farmers, whose annual income does not exceed 3,000 francs. The employer deducts from the wages of his workmen a sum of from 5 to 10 centimes for each day of work, and he is bound to contribute an equal sum to the savings of his employee. The payments are made either to the Workmen's Pension Fund or to a Provident Society regularly authorized.

The State grants an increase of two-thirds to these payments, if the depositor declares, and has it certified at the moment of entering upon the pension, that he has annual resources of less than 3,000 francs, and is not enjoying an annual income greater than 600 francs. It is necessary also that he should have made regular payments from age 25 to age 55, without breaks due to unavoidable causes of more than 5 years.* The depositors may also subscribe for a whole-life assurance for a capital sum varying from 500 to 1,000 francs secured by 30 annual premiums. The State undertakes to defray one-third of these premiums.

A common Fund is maintained by gifts and legacies and by a tax of 10 centimes for each working day, imposed on every employer who has in his service foreign workmen. It is increased by the sums contributed by the State, which are freed on account of pensions above 600 francs, or which have been subscribed for on behalf of depositors who have incomes of more than 600 francs, and the subventions of the State not kept up on account of intermissions in the payments. The annual income of this Fund is employed to meet the anticipated pensions of infirm workmen, up to the amount of half, or the whole, of such pensions according as payments have been made direct, or through a Provident Society.

The financial effects of this proposal would be most serious. They have been fully set forth in an interesting report of M. Guieysse, from which we borrow the following figures—

* The annuity arising from the subvention of the State added to the other income must not exceed 600 francs.

In agreeing with M. Constans that, in a working population of from 9 to 10 millions there would be 3,000,000 members, corresponding to an annual permanent enrolment of 110,000 individuals aged 25 years, the Fund would have theoretically a full number of members (3,072,733) after 30 years, and its full theoretical number of pensioners, aged 55 and over (1,500,790) after 78 years. (The enrolments from 25 to 40 years are neglected, the effect being temporary).

The hypothesis of a payment of 15 centimes per day for 290 days, that is, 43 francs 50 centimes a year, provided half by the workman and half by the employer, requires from the State an annual contribution equal to two-thirds of the sum, that is, 29 francs.

The Pension Fund will receive on the average in respect of each member 72·50 francs, giving the right at age 55 to a life annuity of 450 francs, or 390 francs, according as the rate of interest is calculated at 4 per-cent or at 3½ per-cent.

The annual income of the Fund when it reaches a stationary stage will be 219,148,142 francs, and allowing for the accessory arrangements of the plan, we may place at 100,000,000 in round figures the annual charge imposed on the State.

When assurances against death are taken into account, the fund would have accumulated a capital of about 12 milliards at the end of the 78th year, after which time the number of annuitants would be theoretically constant. The payment of the pensions, taken at 450 francs, would necessitate an annual disbursement of 675,436,500 francs, and the capital sum assured would be 1,600,000,000 francs, corresponding to an average sum of 500 francs payable at each death.

These figures are based upon a rate of interest at 4 per-cent. For a lower rate, either the annuity would have to be reduced or a subsidiary payment would have to be made.

M. Constans has admitted the accuracy of these figures, and he has not disputed that, in view of the probable fall in the rate of interest, the Fund would require in 77 years an invested capital of 16 milliards if the amount of the annuity were fixed at 450 francs.

These estimates are evidently only approximate, since the Fund is optional, and consequently the number of members indeterminate. They are, notwithstanding, sufficient to justify the most serious misgivings. Is it not evident that the accumulation of sums exceeding the enormous figure of 12 milliards is almost impossible to realize? Is it not seen, as said by M. Guieysse, that "such sums thrown, even "gradually, upon the money market, would not be long in crushing it, "by causing a rapid fall in the rate of interest on investments, and in "raising the market value of the public debt, and all analogous "securities?"

There have also been suggested numerous difficulties as to the general arrangements of the plan. The annual income of the members would be difficult to verify. The corresponding payments demanded of the employers might lead to a reduction in wages or to the employment only of workmen who did not join the Fund. The forfeiture clause has also been criticized, which would often render illusory the grants in aid by the State.

The first proposal of M. Guieysse provides for the formation of a National Pension Fund, for the benefit of all workers, and of local Funds, depending on the first, for the purpose of investing the sums

subscribed in the district in French Government securities, in communal loans, or in industrial, agricultural, or commercial securities.

Admission to the Fund is only allowed at the request of the workmen, and a pension cannot be enjoyed before the age of 50, and its maximum is fixed at 600 francs. The payment made by the members may be employed in any form of life assurance. The contributions of the State, equal to the amount of these payments, would not exceed 30 francs a year, and it would cease when the total amount reached 1,000 francs. Contributions by employers, varying from 2 to 6 francs for agriculturists, and from 3 to 9 francs for other employers, are paid into the Fund for 300 days of actual work.

For foreign workmen the contribution is doubled, and it is to be applied in the formation of a Sickness Fund.

Lastly, in a very recent proposal (of 18 December 1897), M. Guieysse admits to the benefit of his Pension Fund only industrial labourers (2,700,000 about). The resources are provided by the payment of 4 per-cent of the wages, borne to the extent of one-half by the employers. The State intervenes, only to make an annual payment equal to the amount of the pension, when the pension is entered upon, that is to say, at 60 years of age.

These short abstracts of the different draft Bills will give a good idea of the variety of opinions which exist in France on the question of workmen's pensions. The actual sub-divisions of our enquiry have, moreover, allowed us to set forth three general tendencies.

The first leads to the admission that all the aged poor have a right to an old age pension, even without having performed any act of thrift. The proposals which embody this view have for only result to introduce a new account into the Poor Law Budget.

The second tendency leads to the conclusion that the workman is incapable of having a thought for his own future. It leads to compulsory assurance.

The last proposals which we have examined show the third tendency. They are, in fact, based upon liberty and personal effort, at least, so far as the workman is concerned. The action of the State only takes place in effective co-operation with individual providence.

We have, moreover, drawn attention to the numerous objections which may be raised to these various proposals, and to the serious financial difficulties which would arise from their adoption.

It now remains for us to speak of a fourth tendency existing amongst a great many of our countrymen, and which consists of seeking, outside State aid, a solution of the problem of workmen's pensions. M. Paul Leroy Beaulieu, in a lively commentary on the various proposed Bills, dilates specially against the new idea of the duties of the State, which he considers to be erroneous, chimerical and mischievous, that is, the idea that "collective action is bound to produce universal happiness."

In view of the remarkable results achieved by free provident institutions, it has been held that the proof of the powerlessness of private effort has not yet been established.

A general law, applicable without distinction to all kinds of workmen, seems to present certain dangers, because it would not take sufficiently into account the needs of each, which vary according to locality, and according to the nature of the employment, and moreover,

because it might deal a damaging blow to the Employers' Funds, which afford to the employed advantages far beyond those which the law would hold forth.

The advocates of liberty in the matter of thrift, are, however, far from admitting that everything is for the best. But they wish that the functions of the State should be limited to the encouragement and stimulation of private effort, without binding it within special limits, and without undertaking engagements perhaps impossible to meet.

They wish also that the State should give encouragement to thrift without distinguishing between Employers' Funds and Official Funds the working of which would be troublesome and onerous.

Lastly, they hope that by development of the spirit of thrift, and of private enterprise, the question of workmen's and old age pensions may be solved without serious disturbance of economic conditions.

On Pension Institutions in Russia. By S. De Savitch.

The different societies which are established in Russia, in order to secure pensions to the members and their families in old age or incapacity to work, are not registered regularly; their accounts are not generally published, and as no attempt has been made to treat statistically even those that are published, it is quite impossible to present a satisfactory description of their position and scope. So I will try to give to the Congress only general information on this subject.

As regarding the members admitted, their payments and the proportions of the pensions allowed, pension-societies have various rules and conditions, I shall deal firstly with Government Funds, secondly municipal and local institutions, thirdly railway societies, and fourthly private, commercial, and industrial offices.

I.—Government Funds.

The functionaries of some State offices and departments* are obliged to belong to special institutions, which are established in order to increase the pensions that these functionaries and their families receive from the Government for service.

As the constitutions of these societies are all very similar, it will be sufficient to explain the most important regulations of one of them.

The Society of the Ministry of War being the oldest and the greatest, I will turn the attention of the Congress to its rules.

There are two categories of members—obligatory and voluntary. All officers of the army and the functionaries of the Ministry of War, in actual service, are obligatory members; officers who, after being some years members of the society, pass to the reserve of the army or join the civil service in some other Ministry, still remaining officers, may be voluntary members. The number of obligatory subscribers is now about 52,000, and that of voluntary about 2,000.

* The departments of War, Marine, Justice, the Postal and Telegraph Offices, the members of the Imperial Household, the Bureau of Infant-schools of Empress Mary, the Board of Engineers of roads of communication, engineers of mines, and so on.

The obligatory members pay to this fund 6 per-cent of their salaries, and the voluntary 10 per-cent.

The pensions are allowed to the members only after having retired from service; the persons who leave the service before they have served 25 years in State offices and have been subscribing to the fund for 20 years, have no right to pension, nor do they receive back the money already paid. An exception is made only in cases of complete incapacity to service.

The amount of pensions paid depends upon three factors—on the number of full years of member's whole State service, on the number of full years he has subscribed to the Fund, and on the rank in which he takes leave of the service.

Regarding the number of years of whole State service, two categories of pensioners are instituted; those who have served more than 35 enter in the first, those who have served 25-35 years, in the second.

Four categories are instituted regarding the time the pensioners have been subscribers to the Fund: over 35 years, and 30-35, 25-30 and 20-25.

According to the rank in which the pensioners leave the service, they are divided into 12 sections.

The following table gives an abstract of the list of pensions.

Years of		General in Chief	Colonel	Ensign
State Service	Subscription to the Fund			
		Roubles	Roubles	Roubles
35	20-25	1341	539	202
	25-30	1609	647	242
	30-35	1877	755	282
	35	2145	863	323
25	20-25	894	359	134
	25-30	1073	431	161
	30-35	1251	503	188
	35	...	...	...

Persons completely incapable of any service, and who have not a right to a pension according to the above list, are all considered as having served 25 years and been subscribers for 20 years.

The families of the pensioner and of the members, who acquired the right to a pension, have also right to the assistance of the society: a widow, alone, receives two-thirds of her husband's pension, and an orphan, alone, one-half of his father's; but the whole family left by a member on pension of the society, cannot get more than the whole sum, obtained by the deceased head of the family. The wives and daughters enjoy their pension until death or marriage, the son, till 21 years of age, or till he enters public service.

I do not propose to give a more circumstantial account of other rules of this society, or to state the distinguishing features of the various societies of this kind.

The following little table will show the financial situation of the most important among them.

The Name of the Society	Year of its Foundation	Number of Members	Annual Revenue		Annual Expenses		Capital in Cash
			Subscriptions of the Members	Other Revenues	Pensions Paid	Other Expenses	
			Thousand roubles				
My. of War . .	1859	54,100	3211	5048	8731	485	111405*
„ Marine .	1860	3,300	†416	1014	1369	72	23269*
„ Justice .	1885	10,700	734	797	372	40	19573†
Engineers of r. of Communication .	1860	1,500	236	285	239	30	3892*
Engineers of r. of Mines . .	1860	...	195		174		1645

*1896. †1897.

Concerning the technical construction of all these societies, it is necessary to mention in the first place, that for balancing all their present and future accounts, they require that a considerable part of their subscribers, remaining, till death, in active service, should not make use of their rights to pensions, and, on the other hand, that many should leave the service before the pensions may be allowed to them; otherwise, the expenses will necessarily exceed the revenues.

So the calculation of the engagements, which such an institution assumes, must be based on the statistics of the average changes in their subscribers and pensioners, with respect to their number, age, rank, duration of subscription, proportion of married persons, number of children, and so on. Statistics of this nature, even when very complete, and based on a long experience, cannot inspire much confidence, because the stability of some observed succession in these matters is very doubtful. Usually, a certain optimism in the valuation of liabilities, long deferred, prevails, and so I cannot help thinking, that the solvency of all these societies is not sufficiently secured. Regarding some of them, it is possible even now to prove their insolvency; for example, a special commission which was established in order to revise the regulations of the Pension-Society of engineers of roads of communication, found, that on the 1 January 1896, the present value of the pensions allowed‡ (including those of the pensioners' widows and children) attained the sum of 2,974,000 roubles, and swallowed up almost the whole capital of the society (3,608,000); the excess of the capital constitutes less than one-fifth of the payments made by all the present subscribers to the fund, so that more than four-fifths of their money must be spent in order to pay off the rights of the foregoing categories of subscribers.

The Government does not guarantee the solvency of these Societies.

‡ The annual payment was 239,000 roubles.

II.—The Municipal and Local Self-Governed Institutions.

In some cities and districts, city and local boards make deductions from their clerks' salaries (5-6 per-cent), and promise them certain pensions, if they remain in the service for a fixed time. The expenses for giving pensions are included in the general Budget of the district. Here we have pensions somewhat similar to those given by the State for the Services.

In many other districts, there are established societies by the employed themselves, usually assisted by the boards. As far as I know, such institutions exist now in 13 districts,* and can be divided, from the technical point of view, into two groups—some (10) imitating the construction of the above-described societies of different Ministries, and others—(3) that of railway employees. The following table gives the principal rules and regulations of the societies first mentioned.

Name of the District	Year of the Foundation	Payments of the Subscribers	Subsidy of the Local Board	The shortest time which gives right to a Pension	Ratio of the smallest Pension Col. (5) to the Salary	The time which gives right to a Pension equal to the Salary	Ratio of Widow's and her Husband's Pensions	Ratio of Orphan's and his Father's Pensions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Viatxa . .	1895	6%	variable	12 years	1/4	27 years	1/2	1/3
Ekaterinoslav	1896	6%	variable	12 „	1/5	25 „	1/2	1/2
Penza . .	1897	6%	variable	12 „	1/4	27 „	1/2	1/3
Riazan . .	1885	6%	variable	12 „	1/4	27 „	1/2	1/2
Samara . .	1896	6%	8½%	15 „	1/3	25 „	1/2	1/2
Simbinx .	1895	6%	2%	12 „	1/5	28 „	1/2	1/2
Smolensk .	1896	6%	5%	15 „	1/2	27 „	1/2	1/3
Tavris . .	1885	6%	variable	12 „	2/9	21 † „	1/2	1/3
Herson . .	1893	6%	3%	20 „	1/2	25 „	1/2	...
Tchernigoff .	1888	6%	variable	15 „	1/4	30 „	1/2	1/2

† The full pension does not exceed two-thirds of the salary.

The conditions of obtaining a right to the pension being so favourable for the subscribers, as the above table shows, there is no doubt that all these societies, without a very large supplementary subsidy from the local boards, will not be able to meet their engagements. So, this winter, a project of a general law on the rational organization of these societies was discussed at the annual meetings of local government representatives. If it be adopted by the State Council, all these societies will have the same technical construction as those of railway employees, whose description I will pass to. Here, I will only observe, that the amount of the capital amassed is now about 3,000,000 roubles, and the number of subscribers is near to 20,000 persons; if the above-mentioned project is adopted, and local government institutions spread over all districts of European Russia,‡ excluding Poland and Finland, this number will read 80-90 thousands, and the annual subscription to the societies' funds, 2½-3 million roubles.

* There are, in Russia, 35 districts in which local self-(zemstow) government prevails.

‡ So it is supposed at the last time.

III.—Railway Societies.

The pension-societies of those employed in railway administration, for the most part, were instituted by the companies soon after the inauguration of traffic on their lines.

The Government, when giving concessions for the construction of railway lines, used sometimes to require the institution of pension-societies for the employees of the companies; these also found it advantageous for themselves, as a means for retaining skilled workmen, so these societies appeared almost in all lines. But the regulations were adopted without serious investigation of their future solvency, the acquisition of the right to a pension was made so easy, that soon after the foundation, almost all the societies became bankrupt. These disasters forced the Government to give serious attention to their organization, and in the year 1888, there was enacted a special law on this subject. In virtue of this law, the existing societies were to be liquidated,* and, instead of them, all the companies were obliged to institute new pension-societies of the employed, with the strict maintenance of the rules of life insurance theory. The principal points of the regulations of the new societies were also prescribed by the law, and were taken from the regulations of the society of the South Western Company† employees. In 1894, on the same principles as the law of 1888, were enacted the regulations of the pension-society of the employees on the railway lines possessed by the State.

I gave a complete account of the construction of these last societies in an article, printed in *Bulletin de l'Institut des Actuaires français*, April 1896, No. 24. Here, I shall only state the most essential points of the laws of 1888 and 1894.

All those employed in a railway line administration form a mutual insurance society, of which they are obligatory members. There are three forms of insurance, enacted by the society regulations: the insurance of pensions for the subscribers themselves, in old age, and in cases of complete incapacity to work, and the insurance of pensions in cases of the death of husbands and parents for the wives and children. Corresponding to these purposes, all the revenues of the society are divided into three funds: that of subscribers, of their wives, and of their children; the distribution of revenue amidst these three funds is indicated by the regulations; the priority is given to the children's fund. The sums, which fall into two other funds, are divided amidst the personal accounts of each subscriber and subscriber's wife. The sums allotted to the personal accounts, are considered as the net premiums of insurance, corresponding to the fund. In this manner, the engagements of the society exactly equal its capital. In the calculation of the net premiums and values, there are assumed, the tables of mortality and incapacity to work of the committee of German railways for the members, that of the Prussian widows' fund for the wives, and of the Prussian population for the children. The annual profits are put into a special reserve fund until this becomes large enough (5-10 per-cent of all the engagements of the society); only after this are the profits divided among the subscribers.

* On some lines were temporarily conserved the saving and assistance societies.

† Its lines now belong to the Government.

The following table presents the financial situation of railway employees' pension-societies.*

Name of the Society	Year of the Foundation	Number of Members (1896)	Capital in Cash on the 1st January of			Pensions Paid in 1896
			1896	1897	1898	
I.—Private Companies:						
Varsaw-Vienna . .	1893	5,600	1899th.r.	2148th.r.	2457th.r.	13,500r.
Vladicaucasus . .	1884	5,300	1821 „	2138 „	2475 „	14,800 „
Irangorod-Dombr. .	1893	3,300	965 „	1130 „	1254 „	7,600 „
Moscow-Kazan . .	1893	5,700	2382 „	2574 „	2737 „	87,100 „
Moscow-Archangel .	1893	3,700	1490 „	1549 „	1665 „	41,800 „
Moscow-K-Voronej .	1893	4,900	1086 „	1308 „	1534 „	15,900 „
Novgorod . . .	1893	500	111 „	122 „	131 „	500 „
Rybinsk-Bologoe . .	1895	1,400	323 „	366 „	408 „	...
Rjazan-Oural . .	1893	10,400	3283 „	3680 „	4100 „	103,100 „
South-East . . .	1894	13,900	2236 „	2799 „	3346 „	16,100 „
II.—State:						
General Society . .	1894	65,000†	7498 „	10464 „	13262 „	...
South-Western . .	1877	24,400	11358 „	12492 „	...	249,850 „
Moscow-Brest . .	1893	7,000	2178 „	2458 „	...	7,400 „

† On the 1st of January of 1898—105,750 persons.

The amount of annual payment of the subscribers reaches 4,100,000 roubles, and other revenues are not less than 2,500,000 roubles.

IV.—Private, Commercial, and Industrial Offices.

In other branches of industry and commerce, besides railways, the pension-societies are not numerous; as far as I know, there are, in Russia, about 25-30 institutions of this kind. For the most part these societies, from the technical point of view, are very unsatisfactory: sometimes the number of the subscribers is so small, that no statistical calculations can be admitted (there are in some banks, clerks' pension societies having less than 100 member); the technical balances generally are not calculated, &c.; so it happens very often, that only the first subscribers can take advantage of the easy conditions of becoming pensioners, and then the society must either be reconstructed on the basis of largely reducing the rights of present and future members, or continues to keep its existence, only, by more or less regular help from the companies themselves.

At last, the Government, as in the case of the railway employees' societies, was forced to enact a law (in 1897), by which the constitution of new societies, whose solvency is not assured, was subjected to considerable supervision. By this law, the Ministries of Finance and of the Interior, were authorized to draw up the regulations of new pension-societies and to allow their inauguration, only on the following conditions:

1. The pension-societies must be instituted with strict regard to the rules of life insurance theory.

* There are, now, six saving and assistance societies of the employed of the railway administration, which soon will be, probably, liquidated and changed into pension-societies.

2. If the technical construction of a society is not strictly comformable to the above regulation, or if the number of subscribers is less than 1,000, its establishment is permitted only, if the company, in which the subscribers are employed, will guarantee the solvency of the society.
3. If the society is founded by a company with the obligatory subscriptions of all the employed, the company is obliged to contribute to the capital of the society.

Besides these dispositions, the above-mentioned law enacts the registration of the societies and obliges them to present their accounts to the Government.

There are some projects of instituting new societies on the above lines, but they are not yet carried out.

Les Pensions de Vieillesse en Espagne.

PAR J. MALUQUER Y SALVADOR.

LES données les plus intéressantes sur le thème en question peuvent se diviser dans les trois classes qui suivent : 1ère, pensions aux employés de l'État ; 2ème, pensions à ceux des entreprises particulières, et 3emè, pensions aux ouvriers.

Pensions aux Employés de l'État.—La législation actuelle sur les *clases pasivas* (l'ensemble des personnes pensionées par l'État) est très-libérale en Espagne, et, pour cette raison, le chapitre du budget général des dépenses de la nation s'élévait il y a peu d'années au 6 % du total budgétaire.

Divers Ministres des Finances ont étudié la réforme très-difficile des droits des pensionnés, et le projet le plus médité sur ce point est celui qui a été soumis au Parlement par M. Gamazo en 1893.

Les règles principales du dit projet sont les suivantes : 1ère, Ceux qui sont employés avant l'approbation du projet conservent les droits que leur reconnait la législation en vigueur. Les employés nommés postérieurement sont régis par les préceptes de la loi nouvelle.

2ème. L'État créera une *Caja general de pensiones* (Caisse générale de pensions) en faveur des fonctionnaires civils et militaires de toutes sortes.

3ème. Les recettes de la Caisse seront : 1° une subvention de l'État (la moitié des traitements affectés aux emplois sans titulaire par suite de leur vacance), 2° des donations ou des legs, 3° la demi-paie mensuelle d'entrée et de promotion des employés, et 4° l'escompte sur leurs appointements, dans la proportion qui suit :

	Jusqu'à 2,000 pesetas . .	3 pour cent.		
De	2,000 à 4,000 „ . . .	4 „	„	
„	4,000 à 5,000 „ . .	5 „	„	
„	10,000 et au dessus . .	12 „	„	&c.

4ème. Chaque employé aura un compte spécial où figureront les escomptes sur son traitement, les intérêts des dites sommes et la partie correspondante de la subvention de l'État.

5ème. Droits des employés, s'ils ont été au service de l'État plus de cinq ans.

Moins de 10 ans de service : ils recevront les demi traitements mensuels susdits.

De 10 jusqu'à 20 ans : ils percevront les sommes antérieures et, en outre, leurs intérêts.

Plus de 20 ans : outre ce que reçoivent les employés de la classe précédente, la subvention de l'État et ses intérêts leur appartiennent.

6ème. Les employés peuvent choisir dans ce cas-là entre percevoir le capital qui est la solde de leur compte personnel ou bien une *rente viagère* equivalente, calculée d'après les tables de mortalité et le taux de l'intérêt commercial.

7ème. Si les employés civils ou militaires perdent la validité pour le travail par suite des blessures qui leur auraient été faites à la guerre ou au service de l'État, ils auront droit, quelle que soit leur ancienneté dans l'administration publique, à une *pension viagère* extraordinaire des deux tiers du traitement qu'ils avaient à l'époque de l'accident.

Toutes ces pensions devront être payées sur les fonds de réserve spéciaux produits : 1° par les escomptes correspondant aux employés qui ont abandonné le service de l'État avant une période de cinq ans ; 2° par les intérêts et la subvention du Gouvernement en faveur des employés qui ont pris leur retraite avant dix ans de service, et 3° par la subvention de l'État qui n'est pas perçue par les employés qui ne comptent pas vingt ans d'ancienneté dans l'administration publique quand ils ont opté pour une pension ordinaire.

Pensions aux Employés des Entreprises Particulières.—Une des sociétés les mieux organisées dans ce but, c'est *l'Asociacion General de Empleados de los Ferrocarriles de España* (Association Générale des Employés de Chemins de Fer d'Espagne).

J'expose à la suite les bases principales des statuts de cette Association qui se rapportent aux pensions de vieillesse.

Les employés des chemins de fer d'Espagne au-dessous de 45 ans, peuvent être membres de la Société en question.

La souscription mensuelle est le 2·50 % des appointements ou bien de la journée des associés.

L'avantage la plus important qu'offre l'Association mentionnée est le droit de retraite de ses membres quand ils sont âgés de 55 ou de 60 ans et qu'ils sont associés depuis 20 ou 15 ans respectivement. Une condition également favorable pour la jouissance du dit droit, c'est la cessation du service dans la Compagnie des chemins de fer par suite de maladie ou d'une autre cause quelque de non-validité, constatée par un examen médical.

Extrait des données du barème général des pensions :

Journée ou appointements annuels.	Pensions annuelles				
	De 7 à 10 ans	15 ans	20 ans	25 ans	30 ans
Pesetas	Pesetas	Pesetas	Pesetas	Pesetas	Pesetas
750	300	375	450	525	600
1,000	300	400	500	600	700
3,000	550	850	1,150	1,450	1,750
8,000	1,050	1,850			

Exemple: Un associé pendant dix ans a eu les cinq premières années les appointements de 2,000 pesetas et les autres cinq ceux de 4,000 pesetas.

$$2{,}000 \times 5 = 10{,}000$$
$$4{,}000 \times 5 = 20{,}000$$
$$\overline{30{,}000} \div 10 = 3{,}000$$

Années d'associé: 10; terme moyen des appointements pendant la dite période: 3,000 pesetas=*pension de vieillesse:* 550 *pesetas* (selon le tarif mentionné).

Pensions aux Ouvriers.—Les questions sociales sont à présent examinées en Espagne sous leur aspect théorique et pratique, et parmi les institutions qui peuvent être mentionnées à cet égard figure l'*Asociacion General para el Estudio y Defensa de los Intereses de la Clase Obrera* (Association pour l'Étude et pour la Défense des Intérêts de la Classe Ouvrière), qui aspire en même temps, comme les anciennes corporations espagnoles de métiers, à attendre le but religieux, dans le sens catholique, et le but économique.

Cette Association compte sur le concours désintéressée de beaucoup de prélats, de personnages aristocratiques, d'hommes politiques de partis différents, de jurisconsultes, de banquiers et d'économistes, et l'un de ses plus actifs promoteurs est le distingué Président du *Banco Vitalicio de España*, M. le Marquis de Comillas.

Les efforts divers faits dans plusieurs contrées d'Espagne pour améliorer la condition des ouvriers ont produit le développement des pensions de vieillesse en leur faveur et j'ai exposé quelques données à ce sujet dans le rapport ' Réparation des Accidents du Travail.'

Les details sur les dites pensions ont, cependant, peu d'intérêt pour l'actuaire, car les tarifs dus à la philantropie des fabricants sont basés d'après leur générosité, et les pensions accordées par les sociétés de secours mutuels, parmi elles les associations de Bilbao, dépendent dans tous les cas de la résolution discrétionnaire du Conseil de la société.

Translation.

Old Age Pensions in Spain. By J. Maluquer y Salvador.

The most interesting information bearing on the question under discussion may be classified under the three following heads, namely: first, Pensions to State Employees; second, Pensions to Employees of private undertakings; third, Pensions to Workmen.

Pensions to State Employees.—Existing legislation in the "classes of Pasivas" (the whole body of State pensioners) is very liberal in Spain, and that is why this item of the general budget of national expenditure amounted a year or two ago to six per-cent of the total.

Various Ministers of Finance have studied the very difficult question of the reform of the rights of pensioners, and the scheme on this point, which has been most fully considered, is that which was submitted to Parliament by M. Gamazo in 1893.

The principal provisions of this scheme are as follows:—

(1) Those who were employees before the adoption of the scheme shall retain the rights conferred upon them by existing legislation. Those appointed subsequently shall be subject to the provisions of the new law.

(2) The State shall establish a "Caja General de Pensiones" (General Pension Fund) for the benefit of civil and military officials of every grade.

(3) The income of the Fund shall be (*a*) subvention from the State, being one-half of the pay allotted to posts without encumbents on account of their being unfilled; (*b*) donations and legacies; (*c*) half a month's pay on the appointment or promotion of an employee; and (*d*) deduction from salaries on the following scale:—

Up to 2,000 pesetas ...	... 3 per-cent
From 2,000 to 4,000 pesetas	... 4 „
„ 4,000 „ 5,000 „	... 5 „
&c.	&c.
10,000 pesetas and over ...	... 12 „

(4) Every employee shall have a special account opened in his name, to which shall be carried the deductions from his salary, interest upon these deductions, and the corresponding share of the State subvention.

(5) Rights of the employees if they have been in the service of the State more than five years.

Less than 10 years, they shall receive a return of the half months' salaries mentioned above under 3 *c*; From 10 to 20 years, they shall receive the foregoing sums with the interest upon them.

More than 20 years; besides the sums received by employees of the preceding class, to these belongs the State subvention, with interest upon it.

(6) Employees may choose in this last case between drawing the capital represented by the balance of their account, or taking an equivalent life annuity calculated by mortality tables at a commercial rate of interest.

(7) If civil or military employees become incapacitated from performing their work by injuries received in war or in the service of the State, they shall have the right, no matter what may have been the length of their service of the public, to a special life pension of two-thirds of the salary they were drawing at the time of the accident.

All these pensions shall be paid out of the special reserve fund created by (*a*) the deductions from the salaries of employees who leave the public service within the term of five years; (*b*) the interest and the Government subvention allotted to those retiring from the service within 10 years; and (*c*) the State subvention which is not taken by those employees of less than 20 years' public service, when they elect to retire on an ordinary pension.

Pensions to employees of private undertakings.—One of the best organized societies in this respect is the "Asociacion General de Empleados de los Ferrocarriles de España" (General Association of Employees of Spanish Railways).

I set forth here the principal provisions of the rules of this Association bearing on old age pensions:—

The employees of Spanish railways under 45 years of age may be members of the said Society.

The monthly subscription is $2\frac{1}{2}$ per-cent of the salaries or of the wages of the members.

The most important benefit granted by this Association is the right to a retiring allowance to those members when they reach 55 or 60 years of age, who have been members 20 or 15 years respectively. Another equally favourable condition entitling to the said allowance is retirement from the service of the railway company, on account of illness or other incapacity, proved by medical examination.

Extract from the General Table for Calculation of Pensions.

Yearly Wages or Salary (Pesetas)	Annual Pension (Pesetas)				
	From 7 to 10 years	15	20	25	30
750	300	375	450	525	600
1,000	300	400	500	600	700
3,000	550	850	1,150	1,450	1,750
8,000	1,050	1,850	...	...	...

EXAMPLE.—A member of 10 years' standing had for the first 5 years a salary of 2,000 pesetas, and for the remaining 5 years a salary of 4,000 pesetas.

$$2{,}000 \times 5 = 10{,}000$$
$$4{,}000 \times 5 = 20{,}000$$
$$30{,}000 \div 10 = 3{,}000$$

Years of membership, 10. Average salary during that period, 3,000 pesetas. Retiring pension, 550 pesetas (according to the above scale).

Pensions to Workmen.—Social questions are at present being investigated in Spain in their theoretical and practical aspects; and among the institutions which may be mentioned in this connection is the "Asociacion General para el Estudio y Defensa de los Intereses de la Clase Obrera" (General Association for the study and defence of the interests of the working classes), which, like the ancient trade guilds in Spain, essays at once to attain a religious purpose, in the catholic sense, and an economic purpose.

This Association relies on the disinterested support of many prelates, persons of rank, politicians of different parties, lawyers, bankers, and economists; and one of its most active workers is the distinguished president of the Banco Vitalicio de España, M. le Marquis de Comillas.

Sundry efforts, made in several districts of Spain to ameliorate the condition of workmen, have led to the development of old age pensions for their benefit, and I have given some information on this subject in my report on "Workmen's Compensation for Accidents."

The details of these pensions have, however, but little interest for actuaries, because the rates, due to the philanthropy of the promoters, are based upon their generosity; and the pensions granted by friendly societies, among them the associations of Bilbao, depend, in all cases, on a discretionary vote of the committee of the Society.

Sur le Projet de Loi pour l'institution d'une Caisse Nationale de Prévoyance pour la Vieillesse et pour l'Invalidité des Ouvriers en Italie. Par le docteur Gino Sestilli, *actuaire de la "Compagnie d'assurance de Milan."*

Le propos de doter l'Italie d'un Institut national de prévoyance, destiné à recuiller les moyens pour pourvoir à l'invalidité des ouvriers inhabiles au travail à cause de vieillesse ou d'invalidité permanente, remonte à une époque arriérrée. Un projet devint loi en 1859, mais cette loi fut inefficace; plusieurs fois successivement on présenta d'autres projets qui cependant n'eurent pas le bonheur d'arriver à la discussion.

Actuellement des dispositions législatives pourvoient à quelques-unes des classes ouvrières; mais aucune institution ne favorise la phalange de tous les autres ouvriers qui sont abandonnés à eux-mêmes dans la difficile entreprise de prévoir de futurs besoins éventuels et d'y pourvoir d'une manière efficace.

Dans le but de faire cesser cet inconvénient, le 13 avril 1897 les ministres Guicciardini et Luzzatti, point découragés par les tentatives infructueuses de leurs prédécesseurs, présentèrent à la Chambre des Députés un projet de loi; et dans la séance du succèssif 24 juin la Commission parlémentaire, présidée par M. Carcano, présenta son rapport favorable au projet. Depuis lors on n'a fait aucun pas vers le but, et il n'y a que trop à craindre que les vicissitudes parlémentaires empêchent cette fois aussi la réalisation de la bonne idée. Il faut cependant souhaiter que cela n'arrive pas, car le projet, bon dans son ensemble, vise à accomplir un œuvre de justice sociale.*

D'après ce projet de loi, la Caisse Nationale de prévoyance pour la vieillesse et l'invalidité des ouvriers s'établit comme un Institut autonome avec le concours financier de l'Etat, concours fixé pour la

* Le projet dont il est question a été récemment discuté et approuvé par la Chambre des Députés.

mesure absolue, et concrété en dotations et assignements annuels tirés de particuliers profits du bilan de l'Etat.

Le patrimoine de la Caisse est constitué au commencement par une dotation de dix millions de lires; ensuite il augmentera sans limite au moyen d'autres assignements, quelques-uns desquels ont un caractère continuatif. On a fixé qu'à la fin de dix années, depuis la fondation de la Caisse, son patrimoine doit monter à non moins de 16 millions, et pour former cette somme on fera, s'il le faut, et dans la quantité nécessaire, des prélèvements sur le revenu annuel.

Ceci est composé des intérêts du patrimoine et des assignements annuels. En total le revenu ordinaire est prévu par le Ministère en 1.250.000 lires au commencement, et en 1.500.000 lires à la fin des premières dix années. A la suite de l'approbation donnée par la Chambre à un projet de loi, la Commission a augmenté le revenu d'un demi-million à peu près.

Après avoir retranché les frais d'administration et, dans les premières dix années, les prélèvements éventuels pour l'augmentation du patrimoine, le revenu annuel est partagé également entre les inscrits qui ont acquis le droit au concours de la Caisse ayant payé dans l'année un minimum de six lires d'après le projet ministériel, ou de neuf lires d'après le projet de la Commission. Néanmoins dans les premières cinq années depuis sa fondation la quote de concours ne pourra être supérieure à 12 lires, limite fixée dans le but d'éviter une trop grande et prévoyable disparité entre les quotes de concours des premières années, dans lesquelles le nombre des inscrits sera exigu, et celles des années successives dans lesquelles les inscrits seront en nombre bien plus grand. Dans le projet de la Commission les ouvriers auxquels on a pourvu par d'autres dispositions législatives, sont exclus de la quote de concours.

Tous ceux qui s'occupent de travaux manuels, ou qui travaillent à quoi que ce soit pour une rétribution journalière, pourront s'inscrire à la Caisse.

La contribution individuelle est à volonté dans la limite d'un minimum de L. 0,50 à chaque versement et d'un maximum de L. 300 par an. On n'a pas fixé le temps de chaque versement; mais seulement le minimum du versement annuel qui donne le droit à la quote de concours.

A chacun des inscrits un compte individuel est ouvert, dans lequel on note les versaments faits par l'ouvrier lui-même, ou par d'autres pour lui et les quotes de concours de la Caisse; mais celles-ci et les intérêts relatifs sont notés séparément des autres sommes. Les intérêts sont accrédités dans la même mesure obtenue par la Caisse pour le total des fonds administrés.

Après 25 années revolues depuis l'inscription, pourvu que l'inscrit ait passé sa soixantième ou soixantecinquième année, selon les prescriptions du Statut de la Caisse, le total résultant du compte individuel est transformé, sauf des cas exceptionnels, en rente viagère sur la base des tarifs adoptés, et passé au fond des rentes viagéres, qui représente la réserve pour les rentes en cours.

La liquidation du compte individuel, qui se réalise dans la manière sus-indiquée, est admise avec anticipation sur le temps fixé, si l'inscrit est frappé d'invalidité permanente, dûment constatée. En ce cas cependant il faut que l'inscription date pour le moins depuis cinq ans.

Dans cette liquidation particuliére, la somme qui résulte du compte individuel pourra être augmentée, dans le but d'élever la pension, qui pourrait résulter trop basse, moyennant des prélèvements d'un fond particulier nommé d'invalidité, qui est formé par d'assignements specials et de dotations annuelles.

Afin de pourvoir au déficit éventuel du fond des rentes viagères, on établit une réserve extraordinaire avec des dotations particulières et des assignements annuels ; naturellement les surplus éventuels du fond des rentes seront déstinés à augmenter cette réserve.

L'accumulation des quotes versées par l'ouvrier peut être à son choix, de l'une ou de l'autre de deux espèces suivantes : accumulation simple à intérêts, ou accumulation mutuelle. Il en suit une division des inscrits en deux catégories bien distinguées ; pour les inscrits de la première les quotes augmentent seulement en y ajoutant les intérêts ; pour ceux de la seconde, en vertu des intérêts et de la répartition des sommes dont on peut jouir à cause de la mort d'inscrits dans la même catégorie.

Dans le cas de la mort d'un inscrit à la première catégorie, si la mort se vérifie pendant la période d'accumulation, la somme produite par l'accumulation de ses versements est dévolue aux héritiers ; dans le cas de la mort d'un inscrit dans la seconde catégorie la sus-dite somme est partagée, ainsi qu'on a déjà dit, entre les survivants de la même catégorie. Les premiers, aprés cinq années depuis le jour du premier versement, peuvent demander la restitution de ce qu'ils ont versé, à qui on ajoute, sauf des restrictions, la moitié des intérêts ; les autres ne peuvent jamais jouir de ce droit.

Les quotes de concours de la Caisse se cumulent indifféremment pour tous les inscrits d'après le système mutuel : cependant les survivants jouissent seulement d'une partie de la somme qui est disponible pour la mort de quelqu'un des inscrits ; l'autre partie concourt à former le fond d'invalidité et la réserve extraordinaire.

De ce résumé et de l'exposition des principales dispositions du projet de loi, sa bonté parait bien évidente. L'Etat ne s'engage au delà de ce que les conditions actuelles du budget peuvent permettre, ni, d'autre côté, il vise à déprimer l'initiative individuelle. Au contraire, il la favorise en assignant des prix aux ouvriers prévoyants. Le prix n'est pas proportionnel à la somme versée par l'ouvriers ; il est égal pour tous; et il est bien qu'il en soit ainsi, afin que les ouvriers, dont les épargnes sont facilités par de plus grands gains ou par de moins lourdes charges, ne soient favorisés au détriment des autres. D'autre part, si l'on voulait récompenser le sacrifice auquel l'ouvrier se soumet, serait-il possible d'en mesurer le poids qui n'est pas en rapport constant avec le versement?

Le projet de loi vise plutôt à donner une aide uniforme qui soit efficace même pour ceux qui peuvent le moins disposer pour les besoins futurs; il vise a prédisposer les choses de manière que les ouvriers prévoyants ne manquent pas dans leur vieillesse du minimum nécessaire à l'existence.

On peut se demander: Les moyens fournis à la Caisse sont-ils proportionnés au but?

Si l'on pense au nombre tres grand d'ouvriers qui pourraient obtenir le concours de la Caisse, et si l'on suppose que tous doivent s'inscrire, on doit répondre, non, sans hésiter; mais cette hypotèse ne paraît

pas vraisemblable. L'idée de prévoyance ne peut gagner terrain que lentement, et quand après un certain temps les inscrits ne seront plus en nombre proportionné à la potentialité de la Caisse, il faut espérer que les conditions économiques de l'Italie seront meilleures, de sorte que l'Etat pourra nouvellement et plus puissamment donner son concours.

Translation.

On the Bill relating to the establishment of a National Provident Fund for the Old Age and Infirmity of Workmen in Italy. *By* Doctor Gino Sestilli, *Actuary of the Assurance Company of Milan.*

The proposal to endow Italy with a National Provident Institution, destined to collect the means of providing against the infirmity of workmen unable to work owing to old age or permanent infirmity, dates back to a far off time. A Bill became law in 1859, but that law was ineffective; several times in succession other Bills were introduced; which, however, did not have the good fortune of reaching the stage of discussion.

At the present time legislative provision is made for some of the classes of workers; but no Institution favors the main body consisting of all the other workmen, who are left to shift for themselves in the difficult undertaking of foreseeing eventual future needs, and of providing against them in some adequate manner.

In order to bring this inconvenience to an end, M.M. Guicciardini and Luzzatti, Ministers of State, not discouraged by the fruitless attempts of their predecessors, submitted, on the 13th April 1897, a Bill to the Chamber of Deputies, and at the sitting of the following 24th June, the Parliamentary Committee, presided over by M. Carcano, presented a report favorable to the Bill. Since then no step forward towards the object in view has been made, and it is only too much to be feared that Parliamentary vicissitudes will once more prevent the realization of the happy idea. It is, however, to be wished that this may not happen, because the Bill, good on the whole, aims at completing a work of social justice.*

Pursuant to this Bill, the National Provident Fund for the old age and infirmity of workmen is to be established as an independent

* The Bill in question has been recently discussed and passed by the Chamber of Deputies.

Institution, with the financial co-operation of the State, co-operation fixed with an absolute limit, and supported by annual endowments and contributions levied upon special items in the State Budget.

The capital of the Fund is to be constituted at the outset by an endowment of 10 million lires; then it will increase without limit by means of other contributions, some of which are of a continuous nature. It is laid down that at the end of ten years from the establishment of the Fund, its capital shall amount to not less than 16 millions, and in order to arrive at this sum, amounts will, if necessary, and to the extent required, be withdrawn from the annual income.

This income will consist of the interest yielded by the capital, and the annual contributions. The total ordinary income is expected by the Ministry to amount to lires 1,250,000 at the commencement, and to lires 1,500,000 at the end of the first ten years. In consequence of the approval granted by the Chamber to the Bill, the Committee has increased the income by about half-a-million.

After deduction of the general expenses and, during the first ten years, of the eventual amounts to be retained in order to increase the capital, the annual income is to be equally divided between the members who have acquired the right to contributions by the Fund owing to having paid during the year a minimum of six lires as laid down by the Ministerial Bill, or nine lires as laid down by the Bill of the Committee. Nevertheless, during the first five years from the establishment of the Fund, the share of contribution is not to be higher than 12 lires, a limit fixed in order to avoid too great and probable a variation between the shares of contribution during the first years, when the number of members is small, and those of following years when the members will be more numerous. In the Bill of the Committee, the workmen for whom other legislative provision has been made are excluded from any share in the contributions.

All who are engaged in manual labour, or who are doing any work whatsoever for daily wages, may be members of the Fund.

The individual contribution is optional, from a minimum of L. 0·50 at each payment to a maximum of L. 300 per annum. No time for making each payment has been fixed; but only the minimum of the annual payment which entitles to the share in the contributions.

A personal account is opened for each member, in which are entered the payments effected by the workman himself, or by others for him, and the shares of contribution by the Fund; but the latter and the relative interest are entered separately from the other amounts. The interest is credited in the same proportion as is obtained by the Fund in respect of the total of the investments administered.

After the completion of 25 years from entry, and provided the member has completed his 60th or 65th year, pursuant to the rules of the Fund, the total accumulations in the personal account are to be converted, except in special cases, into an annuity on the basis of the rates in force, and are to be passed to the Annuity Fund which represents the reserve in respect of current annuities.

The settlement of the personal account, which is made up in the above-mentioned manner, is to be permitted in anticipation of the term fixed, if the member becomes subject to permanent infirmity duly certified. In this case, however, it will be necessary that membership should have been acquired at least five years previously. In connection

with this special settlement, the amount resulting from the personal account may be increased, with the view of increasing the pension, which might be too low, by means of amounts drawn from a special fund called Disablement Fund, and made up by special contributions and annual endowments.

In order to provide against an eventual deficit in the Annuity Fund, a Special Reserve has been established by means of special endowments and annual contributions; of course, any eventual surpluses in the Annuity Fund will be applied to increase this Reserve.

The accumulation of the subscriptions paid by the workman may, at his option, be effected according to one or other of the following two modes: ordinary accumulation with interest, or mutual accumulation. This leads to a division of the members into two quite distinct categories; for the members of the first the accumulations will be increased only by the addition of the interest; for those of the second, by virtue of the interest and by the division of the sums available owing to the death of members belonging to the same category.

In the case of death of a member of the first category, if the death take place within the period of accumulation, the amount produced by the accumulation of his own payments pertains to his representatives; in the case of death of a member belonging to the second category, the above-mentioned sum is divided, as already stated, between the survivors in the same category. The first, after five years from the date of the first payment, may claim the repayment of their subscriptions, to which is added, less certain deductions, one-half of the interest; the others are never entitled to this right.

The shares of contribution by the Fund are accumulated pursuant to the mutual system indifferently for all the members entered: however, the survivors are only entitled to a portion of the sum rendered available through the death of one of the members; the rest goes to form the Disablement Fund and the Special Reserve.

From this summary and the description of its main provisions, the benevolent character of the Bill is evident. The State does not commit itself beyond the limits allowed by the actual conditions of the Budget, nor, on the other hand, does it aim at checking individual initiative. On the contrary, it favours it by granting prizes to provident workmen. The prize is not proportionate to the sum paid by the workman; it is equal for all; and it is well that it should be so, in order that the workmen whose savings are facilitated by greater earnings or by less heavy expenses may not be favoured to the prejudice of the others. Moreover, if it were desired to reward the sacrifice to which the workman subjects himself, would it be possible to measure its weight, which is not in constant proportion to the payment?

The Bill seeks rather to give uniform adequate assistance, even to those who are less able to provide for future needs; it aims at adjusting things so that the provident workmen may not during old age be without that minimum necessary to life.

It may be asked: Are the means supplied to the Fund adequate to the object in view?

If we think of the very great number of workmen who might obtain the assistance of the Fund, and if it be supposed that all become members, the answer must be, without hesitation, No! But

this hypothesis does not seem probable. The idea of thrift can gain ground only slowly, and if later the number of members should be out of proportion to the capacity of the Fund, it is to be hoped that the economic conditions of Italy will then be better, so that the State may once more and with greater power lend its co-operation.

Sur le Système en vigueur pour les Pensions civiles et militaires de l'Etat Italien et sur les tendances à une réforme radicale. Par l'ingénieur Filippo Rainaldi, *chef du bureau technique de la Caisse des dépôts et prêts à Rome.*

Les lois fondamentales qui règlent les pensions civiles et militaires de l'Etat remontent au 1864 pour les employés civiles, et au 1865 pour les militaires, et elles ont un caractère plutôt politique que financier. Ayant été promulguées presqu' immediatement après la constitution du Royaume d'Italie, elles devaient naturellement pourvoir à l'unification administrative, principe sur lequel se fondèrent toutes les lois de ce temps là.

D'après ces lois les pensions, eu égard aux appointements et aux retenues qu'on y appliquait, furent abondamment accordées. Mais le repentir ne tarda pas, et dès le 1870 la Chambre des Députés invita le Gouvernement à réformer les lois en vigueur sur les pensions.

Le système sur lequel elles sont basées est celui de l'inscription, dans le bilan annuel, des pensions à payer pendant l'année et en vigueur pour inscription antérieure, sans aucune cumulation préventive de fonds, soit qu'il perviennent des retenues sur les appointements, ou de particuliers concours ou contributions particulières de l'Etat.

Aussi ce système n'a-t-il aucune analogie avec les Instituts de pensions viagères, ni avec les véritables Caisse-pensions. S'il forme l'objet de ce rapport, c'est seulement pour le comparer aux autres systèmes rationnels à base mathématique, sur lesquels se fondèrent les études des différents projets de loi sur l'institution d'une Caisse de prévoyance pour les pensions civiles et militaires, suivies jusqu'aujourd'hui.

Les lois en vigueur ne pourvoient pas à l'accumulation des fonds nécessaires à la constitution des assignements de retraite ; de plus elles présentent un manque permanent d'équilibre entre les valeurs capitaux des recettes et des dépenses : outre à cela elles donnent lieu à une distribution irrationelle de ces fonds, puisque le montant des pensions est indépendant de l'âge.

Dans le but d'ôter ces deux fautes du système actuel des pensions, on tourna toutes les études, depuis 1880, sur la constitution d'une caisse de prévoyance qui dût pourvoir à la concession des pensions en délivrant le budget de la charge excessive de la dette viagère, qui est destinée à augmenter encore pendant une longue succession d'années, jusqu'à atteindre une constante excessivement élevée en rapport aux ressources financières du budget. Au lieu de passer en revue ces études, il sera peut-être plus opportun, pour justifier mon rapport, d'exposer les principes qui ont servi de base à ce qu'on a proposé; aussi ce rapport aura-t-il son origine des tendances qui se manifestèrent jusqu'ici sur la réforme, dont je viens de parler.

Il faut cependant premettre une exposition sommaire des dispositions actuelles qui règlent les liquidations au moment de la retraite, afin de mieux expliquer la comparaison entre leur application et celle qui résulte de quelques-uns des systèmes théoriques, qui sont à présent plus dans l'usage.

La limite minime du droit pour obtenir la pension, d'après la loi du 14 Avril 1864 et suivantes, a été établi, pour les employés civiles, en 25 années de service et 65 années d'âge, et la limite maxime qui donne droit aux $^4/_5$ de la pension a été fixé en 40 années de service. Nèanmoins l'employé peut être placé en pension après 25 seules années de service, sans aucune limitation d'âge, pour maladie, pour dispense du service, ou pour placement en disponibilité.

La pension est liquidée sur la moyenne des appointements dont on a joui dans les dernières cinq années en base à autant de quarantièmes sur les premières 2000 lires d'appointements que d'années de service, et à autant de soixantièmes sur la somme au-délà de 2000 lires.

La mesure minime des pensions est de 150 lires et la maxime de 8000 lires.

De la dizième à la vingtquatrième année de service la loi accorde une indemnité égale à autant de douzièmes sur les premières 2000 lires d'appointement et autant de dixhuitièmes sur les sommes en surplus, que les années de service de ceux qui sont devenus à jamais inhabiles à continuer le service, ou sont dispensés du service même, ou sont placés en disponibilité, ou ont atteint la limite maxime de l'âge, c'est-à dire 65 ans.

La veuve et les orphelins de l'employé ont droit à l'indemnité entière, ou à la pension dans la mesure d'un tiers de celle à qui son mari ou leur père aurait eu droit.

Pour les militaires, leurs veuves et leurs orphelins les pensions sont réglées d'après la loi 7 février 1865 et suivantes, par des dispositions de liquidation égales à celles des fonctionnaires civiles, mais avec des variations sensibles dans les limites de l'âge et du service.

La retenue moyenne sur les appointements des fonctionnaires civiles et des militaires, est environs de 3% des appointements, et elle résulte d'une retenue continuelle, graduellement croissante de mille à mille lires d'appointement jusqu'aux 5000 lires, de la mesure minime d'1 % sur les premières 800 lires jusqu'au maxime de 6 %, et aussi d'une retenue extraordinaire, appliquable une seule fois, de 15 % sur l'appointement primitif, et du 25 % sur les augmentations successives, qu'on paie en 12 quotes mensuelles posticipées. Ces retenues vont bénéficier le budget de compétence, et l'État inscrit annuellement

les pensions dans le même budget, en tenant le nécessaire compte préventif des pensions en cours, des annulations et des nouvelles inscriptions.

Il est évident que par ce système il n'existe aucun rapport entre les recettes et les dépenses rélatives aux pensions, et l'Etat est exposé à pourvoir par les recettes de son bilan annuel à la dette viagère qui parcourt encore la branche ascendante de la courbe en conséquence des graduelles et sensibles augmentations du nombre des employés nécessaires au fur et à mesure que l'organisation administrative et militaire s'est formée et graduellement développée.

Les différents projets de loi, qui, depuis 1880 jusqu'aujord'hui, furent étudiés, et quelques-uns présentés aux deux branches du Parlément, pour la réforme des pensions civiles et militaires, eurent le but de sostituer au système en vigueur un autre, qui assurât l'équilibre financier entre la prime et le traitement de pension, et qui pourvût à l'accumulation des fonds, nécessaires aux pensions, pendant le service des employés.

D'après ces projets législatifs, ces fonctions seraient confiées à un Institut autonome de prévoyance qui aurait une vie à lui, et qui, tandis qu'il serait une garantie pour les fonctionnaires, déchargerait l'Etat d'une dette, qui représente une menace continuelle pour son budget.

Dans les différents projets de loi indiqués, on a étudié le problème sous le double aspect de l'assurance viagère et de la plus grande étendue possible du droit à la retraite, en évitant, par une réserve spéciale, l'aléa qui résulte de l'application des systèmes rationnels actuellement adoptés pour les Instituts de pensions et qui a sa source dans l'inévitable baisse du taux de l'intérêt et dans la mortalité.

Les principes fondamentals des projets de réforme peuvent se résumer ainsi:

(*a*) mesure des retenues sur les appointements et des contributions de l'Etat, tels qui puissent garantir un juste traitement de pension;

(*b*) mesure des pensions, dépendant de la conversion en rente viagère des sommes qui perviennent au titulaire, ou à sa veuve, ou à ses enfants mineurs, de l'accumulation des recettes qui lui sont dûes, avec ou sans l'effet des décadences, arrivées précédemment, selon le système de base de la réforme;

(*c*) réserve de garantie.

Ces trois éléments assument des valeurs divers, pour la distribution des capitaux accumulés, non seulement d'après le système adopté: *des comptes individuels, mutuel* ou *mixte,* mais aussi d'après la méthode d'accumulation des recettes, soit-elle *aprioristique,* ou des *évènements accomplis.*

Et il résulte aussi une autre distinction de l'adoption de retenues sur les appointements et de contribution de l'Etat, commesurées sur l'appointement courant, ou concentrées au commencement du service, ou respectivement aux dates particulières, relatives aux successives augmentations d'appointement.

Il est évident que des plusiers combinaisons de tant d'éléments il résulte autant de formes d'assurance sur la vie, théoriquement parfaites,

et préférables les unes aux autres selon les conditions particulières *de service* du personnel qui doit s'inscrire à l'Institut, ou financières de l'Etat ou société qui concourt à la constitution des fonds.

Pour l'Etat on a essayé des différentes solution du problème, mais aucune d'elles n'obtint encore le suffrage des deux branches du Parlément; cependant la réforme ne tardera pas beaucoup; puisque le Gouvernement s'est engagé formellement de détacher nettement le personnel assumé en service avant le premier août 1897, à qui les lois en vigueur sur les pensions doivent être encore appliquées, de l'autre assumé après cette date, qui sera soumis aux dispositions d'une Caisse de prévoyance, pour la quelle une Commission expresse à achevé les études.

Quand ses résultats auront formé l'objet d'un projet de loi ministériel, je me réserve de les résumer à l'Association Italienne des actuaires, de laquelle j'ai l'honneur de faire part; à présent une indication quelconque serait inopportune, ainsi qu'un jugement sur une réforme, qui se trouve encore dans son état embrional.

On trouve une garantie qu'on arrivera à la solution du problème, sans d'autres difficultés, si des raisons financières ne serront d'opposition, en deux Instituts de pensions réglés tous les deux d'après le système mutuel aprioristique, et analogues aux sociétés d'assurance sur la vie.

Je veux parler du *Mont* des pensions des enseignants élémentaires, qui fit un très bon essai, et de la Caisse-pensions des médecins de conduite, qui va s'instituer, et que devra commencer à fonctionner le prémièr janvier 1899. Le projet de loi relatif sera sous peu en discussion au Sénat, ayant été déjà approuvé par la Chambre des Députés.

L'administration de ces deux Instituts autonomes est confiée à la Caisse des Dépôts et Prêts, surveillée par une Commission tecnique permanente, qui veille à leur dévoleppement économique-financier, et propose au Ministre du Trésor les réformes éventuellements nécessaires, à la suite des résultats des respectives bilans tecniques.

Le simple système mutuel pouvait être appliqué et il le fut en effet, pour les deux Instituts dont je viens de parler, puisqu'il s'agissait de catégories de personnel admises *ex-novo* au droit de pension, sans l'existence de catégories précédentes ayant des droits différents. Mais, ainsi que j'ai déjà dit, ce système ne pourrait pas être suivi pour le personnel d'Etat récemment assumé parce qu'il en résulterait de trop grandes différences de traitement, rapport à des fonctionnaires dans les mêmes conditions d'âge et de service, mais diversement récompensés dans leur vieillesse seulement parce qu'ils ont été assumés en temps divers.

Cet inconvénient, si non tout-à-fait fut néanmoins atténué en grande parties par d'opportunes dispositions, qui, si elles pouvaient être admises dans un système mixte, ne pouvaient pas absolument l'être dans un système tecniquement et rigoureusement mutuel.

Translation.

On the System in force for Civil and Military State Pensions in Italy, and on the Tendencies towards Radical Reform. By Filippo Rainaldi, *Engineer, Chief of the Technical Staff of the Fund for Deposits and Loans in Rome.*

The fundamental laws which regulate Civil and Military State Pensions date back to 1864 for Civil Servants and to 1865 for the Military, and they are more of a political than of a financial nature. Having come into force almost immediately on the establishment of the Italian Kingdom, they had naturally to provide for administrative unification like all the other laws of the period.

Under these laws, pensions, having regard to the salaries and to the deductions made therefrom for the purpose, were lavishly granted. But repentance was not long delayed, and since 1870 the Chamber of Deputies has been pressing the Government to reform the pension laws.

The system on which the pensions are based is that of making a charge in the annual budget for the pensions falling into possession during the year, and for those still in force from previous years, without any preliminary accumulation of funds, whether arising from deductions, from salaries, or from special assistance or contributions on the part of the State.

This system bears no analogy to Institutions for the grant of Life Annuities, nor to true Pension Funds. If I take it up as the subject of this Paper, I do so only to compare it with the other rational systems founded on a mathematical basis, which have been the groundwork of the various Bills for establishing a Provident Fund for Civil and Military Pensions, brought forward up to this date.

Present laws do not provide for the accumulations of the funds necessary to secure the retiring allowances; and, moreover, from them is absent permanent equilibrium between the capitalized values of receipts and expenditure. Besides, they give rise to an irrational

distribution of the funds, because the amount of pension is independent of age.

With the view of removing these two defects of the present pension system, all efforts since 1880 have been directed to establish a Provident Fund intended to bear the burden of the Pensions, and to relieve the budget of the excessive weight of the life annuities, which will still grow for many years, until it reaches a figure very high in proportion to the financial resources of the budget. Instead of reviewing these efforts, it will perhaps be more convenient, as an excuse for this Paper, to explain the principles which have been the basis of the proposals. Also, this Paper has its origin in the tendencies which have so far been manifested towards the reform to which I have referred.

I must nevertheless be permitted to give a brief summary of the rules in force for arriving at a settlement at the moment of superannuation, so as to make more clear the comparison between their working and that of some of the theoretical systems which are at present in operation.

The lower limit giving right to a pension, according to the law of 1864 and those following it, has been fixed, for Civil Servants, at 25 years of service and 65 years of age, and the upper limit which gives right to $\frac{4}{5}$ of the pension at 40 years of service. Nevertheless the servant may be placed on pension after only 25 years of service, and without any age limit, on account of sickness, or if he be removed from the service, or ifhe be placed on the reserved list.

The pension is calculated on the average salary drawn during the last five years, on the basis of one-fortieth of the first 2,000 lires of salary for each year of service, and one-sixtieth of everything above 2,000 lires. The minimum pension is 150 lires, and the maximum 8,000 lires.

From the tenth to the twenty-fourth year of service the law grants compensation, equal to as many twelfths of the first 2,000 lires of salary, and as many eighteenths of any excess, as there are years of service, and to those who are permanently incapacitated from continuing their work, or who are removed from the service itself, or who are placed on the reserved list, or who have attained the maximum limit of age, that is 65 years.

The widows and orphans of the employee are entitled to the whole of the compensation, or to one third of the pension to which the husband or father would have been entitled.

For the Military and their widows and children, the pensions are regulated according to the law of 7 February 1865 and those which followed it, by methods of calculations the same as for Civil Servants, but with appreciable differences as to limits of age and service.

The average deduction from the pay of civil and military functionaries is about 3 per-cent, and consists of a constant deduction, gradually increasing from thousand to thousand lires of pay, up to 5,000 lires, from a minimum of 1 per-cent on the first 800 lires up to a maximum of 6 per-cent; and also of a special deduction, taking place only once, of 15 per-cent on the first salary, and of 25 per-cent on its successive increments, payable by 12 monthly instalments. These deductions are passed to the credit of the departmental budget, and the State annually enters the pensions in the same budget, taking the

necessary account in advance of the current pensions, of the cancelments, and of the new entries.

It is evident that under this system there is no relationship between receipts and expenditure connected with pensions, and the State is under the liability to provide from the income in its annual budget for the debt for life annuities, which is still on the ascending branch of the curve, because of the gradual and perceptible increase in the number of employees required according as the administrative and military organizations are formed and gradually developed.

The different Bills which, from 1880 to the present day, have been drafted, and some of which have been submitted to the two Houses of Parliament, for the reform of civil and military pensions, have had for object to substitute for the system in force another, which would ensure financial equilibrium between the premium and the provision of pension, and which would provide for the accumulation of the the funds necessary for the pensions during the period of service of the employees.

According to these legislative proposals, these functions would be entrusted to an independent Provident Institution, which would have a self-dependent existence, and which, while it would give a guarantee to the functionaries, would relieve the State of a liability which represents a continuous menace towards its budget.

In the various Bills mentioned, the problem has been studied from the double point of view of life assurance and of the widest possible extension of the right to superannuation, and with the object of avoiding, by means of a special reserve, the effects produced by the application of rational systems actually adopted for Pension Funds, and which arise from the unavoidable fall in the rates of interest and mortality.

The fundamental principles of these reform proposals may be summarized as follows:

(a) The amount of deductions from pay, and of the contributions by the State, to be such as to guarantee an equitable scale of pensions.

(b) The scale of pensions to depend on the conversion into a life annuity, of the sums coming to the person entitled, or to his widow, or to his infant children, from the accumulations of receipts due to him, with or without the results of withdrawals which may have previously taken place, according to the system adopted in the scheme of reform.

(c) A guarantee Reserve Fund.

These three elements have various effects on the distribution of the accumulated funds, not only according to the particular system adopted, that of individual accounts, of mutual assurance, or of a combination of both plans; but also according to the plan of accumulating the receipts, whether by a prospective method, or in view of events which have actually happened.

And another distinction also arises from the adoption of the plan of deductions from pay with contributions by the State, levied on current salaries, or concentrated at the beginning of service, or respectively at special dates coincident with the successive increases of pay.

It is evident that from the various combinations of so many factors, there result a corresponding number of forms of life assurance, theoretically perfect; and to be preferred one over the other, according to the special conditions of service of those who are to be enrolled in the Institution, or of the finances of the State, or of the Society which assists in providing the funds.

For the State different solutions of the problem have been adopted, but none of them have yet received the approval of both Houses of Parliament. Nevertheless, reform will not be much longer delayed, because Government is formally committed to separate sharply the staff who entered the service prior to 1 August 1897, to whom the rules actually in force as to pensions will remain applicable, from those who entered the service after that date, and who will come under the regulations of a Provident Fund, regarding which a Special Commission has been sitting.

When the results of the enquiries have taken shape in a Ministerial Bill, I undertake to submit a summary of it to the Italian Association of Actuaries, to which I have the honour to belong. At present any hint as to the plan would be inopportune, as also it would be to pass judgment on a reform still in an embrionic state.

We have some evidence that a solution of the problem will be reached without other difficulties, if financial reasons do not stand in the way, in the example of two Pension Institutions both worked acording to the mutual prospective method, and analogous to life assurance societies.

I refer to the Pension Fund for Elementary Teachers, which has made a very good start, and the Pension Fund for Departmental Doctors, which is being established, and which is to commence operations on 1 January 1899. The Bill regarding it will very soon be debated by the Senate, it having already passed the Chamber of Deputies.

The working of these two independent Institutions is entrusted to the Deposit and Loan Fund, supervised by a permanent technical committee, which looks after their economic and financial development, and suggests to the Finance Minister such reforms as become necessary, according to the results of their respective valuation balance sheets.

It was possible to apply the simple mutual system, and as a matter of fact, it was so applied, to the two Institutions which I have just mentioned, because there were in question classes of individuals admitted for the first time to pension rights, without there being other pre-existing classes with different rights. But, as I have already said, this system could not be followed for the State staffs recently entered, because there would result too great differences of treatment with regard to functionaries in the same conditions as to age and service, but differently provided for in their old age only because they entered the service at different times.

This inconvenience, if not entirely avoided, was nevertheless minimized by suitable arrangements, which, while they could be included in a mixed system, could not have been so in a system technically and rigorously mutual.

Les conditions actuelles des Caisses des chemins de fer en Italie et les tendances qui paraissent prévaloir. Par l'ingénieur Francesco Benedetti, *chef de service de la "Société Italienne des chemins de fer méridionaux", à Rome.*

Les chemins de fer du continent italien et de la Sicile formaient, avant juin 1885, quatre grands réseaux: Haute Italie, Romains, Calabro-Siciliens et Méridionaux, les trois premiers appartenants à l'Etat qui les exploitait directement ou indirectement, le dernier construit et exploité par une Société privée. (1) Chacun de ces réseaux avait une Caisse de pensions pour le personnel commissionné, ayant pour objet d'offrir des pensions de retraite, après un certain nombre d'années de participation, soit aux agents ayant du quitter le service à cause d'invalidité ou vieillesse, soit, en cas de leur mort, à leur famille. Ils avaient, en outre, une Caisse de secours pour le personnel non commissionné, ayant pour objet de fournir aux inscrits, en cas de maladie, l'assistence médicale et les médicaments et de leur venir en aide en cas d'invalidité permanente au travail.

Pour atteindre ces buts, les recettes des Caisses resultaient et résultent surtout des contributions mensuelles des agents et des Administrations des réseaux: ces recettes equivalaient, en ce temps, par rapport aux appointements des inscrits, à 7 °/₀ pour les Caisses de pensions, et à environ 3½ °/₀ pour les Caisses de secours.

En juillet 1885, dans le but de délivrer l'Etat de l'exploitation des réseaux de la Haute Italie, des chemins de fer Romains et des Calabro-Siciliens, on institua les trois grandes compagnies actuelles, dont deux pour l'exploitation des chemins de fer du continent italien, et l'autre pour l'exploitation de ceux de la Sicile: on eut ainsi les trois grands réseaux de l'Adriatique, de la Méditerranée et de la Sicile. Pour des raisons dont l'exposition nous entrainerait trop loin, il fut alors impossible de fondre ensemble les Caisses existentes: on dût donc, en janvier 1890, instituer une nouvelle Caisse de pensions et une nouvelle Caisse de secours pour chacun des trois nouveaux réseaux, tout en conservant en vie les anciennes quatre Caisses de pensions et la Caisse de secours du susdit réseau Romain.

Les Compagnies d'exploitation des réseaux de moindre extension et même quelques Sociétés de Tramways ont, elles aussi, institué des Caisses de pensions et des Caisses de secours, mais leur importance

(1) On ne parle pas ici des chemins de fer de la Sardaigne parce que, si, à l'époque dont il question, ils étaient peu de chose, aujourd'hui, bien qu'augmentés, ils n'ont guère d'importance à côté des grands réseaux dont ci-dessus.

étant relativement limitée, il nous suffira de remarquer ici qu'elles sont en nombre de 12, avec environ 13 mille participants, tandis que ceux inscrits aux Caisses des grands réseaux atteignent presque le chiffre de 76.000.

Au 31 décembre 1889, alors que les nouvelles Caisses étaient institutées, les huit Caisses avaient un déficit arriéré de plus de 90 millions et un déficit courant annuel d'environ 2 millions de lires. C'était là une situation très-grave dépendante des circonstances exceptionnelles qui ne permirent, tout d'abord, d'augmenter, tant qu'il en était temps, les recettes: on les augmenta bien dans la suite, mais la mesure fut insuffisante, la baisse du taux de l'intérêt ayant malheureusement contribué à l'insuccès partiel des mesures adoptées.

Telle étant la situation, et la nécessité d'avoir recours à des moyens plus radicaux s'imposant, le Gouvernement et les Sociétés formulèrent d'accord un projet de loi, qui, à la suite de nombreuses modifications, finit par aboutir à la loi d'août 1897, puis au projet de loi de fevrier dernier, dont la discussion par le Parlement devrait être imminente.

La loi de 1897 eut pour but:

(*a*) de clore les inscriptions aux Caisses existentes et d'émaner de nouveaux Statuts obligatoires pour tous les participants;
(*b*) de créer une nouvelle institution ayant pour base, plutôt que la mutualité, des comptes individuels tenus séparément pour chaque participant;
(*c*) d'établir certaines taxes sur le transport des marchandises et des voyageurs, afin d'en tirer l'annuité nécessaire pour combler le déficit arriéré.

Cette dernière mesure est déjà en vigueur; la clôture des Caisses est, elle aussi, un fait accompli; le reste pourra recevoir son exécution dès que le projet de loi présenté, nous l'avons dit, en février, aura été approuvé.

Voci maintenant les principales dispositions des nouveaux Statuts ayant pour but de réorganiser convenablement les Caisses actuelles:

(*a*) pour les deux Caisses: augmenter les recettes;
(*b*) pour les Caisses de pensions: proroger de cinq années, l'âge et la durée de la participation requis pour que les agents aient droit à la pension de retraite; réduire d'un sixième la pension aux veuves;
(*c*) pour les Caisses de secours: supprimer les allocations facultatives, ainsi que celle qu'on alloue actuellement pendant les premières journées de maladie.

Moyennant la clôture des inscriptions, et dans le cas où les mesures ci-dessus seraient adoptées, la situation technico-financière des nouvelles Caisses sera telle que le déficit arriérré au 31 décembre 1896 se montera, pour l'ensemble des Caisses de pensions et de secours, à 145 millions de lires et que, en moyenne, les recettes annuelles devront être augmentées dans la mesure de 2,40% des appointments des inscrits.

La nouvelle institution, qu'on aura à fonder pour les agents qui sont entrés en service depuis le premier janvier 1897, a pour base le système des comptes individuels, dans le double but que les partici-

pants gardent toujours la propriété de leurs versements avec les intérêts relatifs, et de restreindre le jeu de la mutalité aux recettes accessoires des deux Caisses, et aux contributions des Administrations des chemins de fer lorsque celles-ci n'ont pu être payées, faute d'ayants droit.

Ce nouveau mecanisme peut être considéré comme l'explication des tendances qui, en cette matière, paraissent prévaloir chez les grandes Administrations des chemins de fer et dans les sphères gouvernementales.

Le tableau annexe sert à la comparaison entre les traitements offerts par la nouvelle institution, et ceux qu'on obtiendrait des Caisses actuelles où la mutualité est complète.

Il y a lieu d'ajouter que des organisations analogues à celle dont nous avons fait l'exposition, peut-être même avec une plus résolue application du compte individuel, ont déjà été adoptées, en Italie, pour le personnel de plusieurs tramways, de quelques chemins de fer secondaires et de quelque autre Administration, entre autres celles de la Municipalité de Turin et de la Banque d'Italie.

On ne manquera probablement pas de remarquer que si un tel système peut être justifié lorsqu'il s'agit d'Administrations restreintes, où le personnel ne saurait être nombreux, il n'en peut être de même dans le cas des grandes Administrations ayant quantité d'agents. Au point de vue technique on aura parfaitement raison. Quand on est à jour des progrès faits par la science, il n'est pas permis d'en négliger l'application. Mais dans les grandes Administrations de chemins de fer il ne suffit pas d'adopter toutes les garanties suggérées par la science pour faire disparaitre tous les risques, ceux-ci pouvant se relier non seulement à la baisse du taux de l'intérêt, mais encore aux exigences du progrès dans les services par rapport aux oscillations du trâfic, auquel cas les Compagnies n'auraient plus le loisir de faire peser ces risques, même seulement en partie, sur leur personnel; et cela d'autant plus que ce personnel, par cela même qu'il est très nombreux, ne consentira pas aisément à reconnaitre ce qu'il peut y avoir d'aléatoire dans certaines stipulations chaque fois que l'aléa lui sera défavorable.

Les masses utilisent volontiers la force qui leur vient du nombre pour réclamer des droits, mais elles ne sont pas toujours autant diposées à remplir leurs devoirs, même lorsqu'ils découlent d'un contrat librement accepté: et ces masses ont malheureusement le moyen de s'imposer, lorsqu'elles constituent un des principaux instruments de l'économie nationale.

D'autre part il ne faut pas oublier que, par cela même que le service public des chemins de fer est étroitment connexe avec l'économie générale du pays, et même avec sa sûreté, il est nécessairement sujet à une directe ingérence de la part de l'Etat; il s'en suit que bien que ce service soit confié à des Administrations privées, celles-ci ne s'en trouvent pas moins contraintes par des formalités burocratiques qui se prêtent fort mal à la rapidité d'exécution des mesures, même seulement administratives, qui pourraient être exigées par les circonstances; de sorte que, bien des fois, malgré la nécessité évidente de ces mesures, le mal peut avoir rapidement grandi avant qu'on ait pu les mettre en exécution.

En conclusion, si, au nom des sains principes de la science, le système des comptes individuels pourrait être sujet à critique, si l'on veut, au contraire, tenir compte des devoirs de diverse nature que la

prudence impose à une grande Administration de chemins de fer, les tendances prévalentes actuellement chez ces Administrations et chez les sphères gouvernementales en Italie en résulteront plus que justifiées, en tant qu'elles se proposent de concilier l'intérêt bien entendu du personnel avec celui des Administrations.

Tableau.

Montant annuel des rentes viagères offertes par les "Caisses Pensions et de Secours" pour un agent admis à l'âge de 25 ans.

Indications	Âge de l'Agent au Moment de la Retraite					
	40-45	45-50	50-55	55-60	60-65	65-70
	L.	L.	L.	L.	L.	L.
I.—*Caisses pensions.*						
(*a*) Avec le système actuel*:						
Retraités . . .	745	1.039	1.363	1.709	2.097	2.484
Veuves de retraités . .	447	623	818	1.025	1.258	1.490
Veuves de defunts en activité de service . avec enfants	558	778	1.022	1.281	1.573	1.863
Veuves de defunts en activité de service . sans „	447	623	818	1.025	1.258	1.491
(*b*) Avec le système des comptes individuels:						
Retraités	687	984	1.321	1.684	2.089	3.240
Veuves de retraités . .	412	590	793	1.010	1.253	1.944
Veuves de morts en activité de service . avec enfants	313	496	762	1.132	1.737	2.620
Veuves de morts en activité de service . sans „	235	371	569	844	1.293	1.258
II.—*Caisses de secours.*						
(*a*) Avec le système actuel* .	235	319	395	471	554	632
(*b*) Avec le système des comptes individuels . .	150	204	252	300	358	403

Observation.—On admet que le premier appointement d'un agent admis à la Caisse pension soit de L. 1.200, et que celui d'un agent de la Caisse de secours soit de L. 685 ; par effet des augmentations, après 35 ans de service, le premier vient à être triplé ; l'autre, dans la même période de temps, est seulement de L. 900.

* Le traitement fait actuellement est en réalité supérieur : mais il n'est pas en rapport avec les ressources dont les caisses disposent à présent, ressources qui servirent de base au calcul des rentes dont dessus.

Translation.

On the Present Condition of the Railway Funds in Italy, and the Tendencies which appear to prevail. By Francesco Benedetti, *Engineer, Chief of the Staff of the Société Italienne des Chemins de Fer Méridionaux, at Rome.*

The Railways of Continental Italy and of Sicily comprised, previous to June 1885, four great systems: "Alta Italia", "Romane", "Calabro-Sicule", and "Meridionali", the first three being owned by the State, which worked them directly or indirectly, the last built and worked by a private Company.* Each of these systems had a Pension Fund for the Commissioned Staff, which had for object to provide retiring Pensions, after a certain number of years of membership, either to the officers who had had to leave the service on account of ill-health or of age, or, in case of their death, to their families. They had besides an Assistance Fund for the Non-Commissioned Staff, which had for object to provide for the members, in case of sickness, medical attendance and medicine, and to come to their aid in event of permanent inability to work.

To attain these ends the income of the Funds was derived, and still is derived, from monthly contributions of the members and of the management of the Railway Systems; this income being equivalent at that time, as regards the pay of the members, to 7 per-cent for the Pension Funds and to about 3½ per-cent for the Assistance Funds.

In July 1885, with the view to relieve the State of the working of the Systems of "Alta Italia", of the "Romane" Railways, and of the "Calabro-Sicule" Railways, there were established three great Companies, which are still in existence, of which two were to work the Railways of Continental Italy, and the other those of Sicily. There thus arose the three great systems of the "Adriatic", of the "Mediterranean", and of "Sicily." For reasons, to explain which would take us too far, it was not possible to amalgamate the then existing Funds. It therefore became necessary, in January 1890, to establish a new Pension Fund, and a new Assistance Fund, for each of the three new systems, preserving at the same time the four old Pension Funds, and the Assistance Fund of the Romane System above mentioned.

* We do not here mention the Sardinian Railways, because, if at the time in question they were of small account, to-day, although they have developed, they have but little importance as compared with the four great systems named above.

Some Railway Companies of lesser magnitude, and even some Tramway Companies, have also established Pension Funds and Assistance Funds; but their importance being relatively small, it will be sufficient here to state that they are 12 in number, with a membership of about 13,000; while the membership of the Funds of the great Systems reaches nearly to the figure of 76,000.

On 31 December 1889, the date of establishment of the new Funds, the eight Funds had an accumulated deficiency of 90,000,000 Lires, and a current annual deficiency of about 2,000,000 Lires. This was a very serious situation, depending on exceptional circumstances, which at first, although it was then high time, did not permit of the income being increased. The income was increased later on, but to an insufficient extent, the fall in the rate of interest having unfortunately contributed to the partial failure of the steps taken.

Such being the position, and the necessity having become imperative of taking more radical measures, the Government and the Companies in concert drafted a Bill, which, after many amendments, was passed into law in August 1897, and again another Bill last February, the discussion of which by Parliament should not be long delayed.

The law of 1897 had for object:

(*a*) To close to new entrants the existing Funds, and to establish fresh Rules compulsory on all members.
(*b*) To establish a new Fund, having for basis, not mutual assurance, but individual accounts kept separately for each member.
(*c*) To impose certain taxes on the freight of merchandize and on the fares of passengers, so as to raise the annual sum necessary to liquidate the accumulated deficit.

This last measure is already in force. The closing of the Funds is also an accomplished fact. The other arrangements will be carried out when the Bill, brought forward, as we have said, last February, shall have been passed.

The following are the principal provisions of the new Rules intended to suitably reorganize the existing Funds:

(*a*) For both classes of Fund, to increase the income.
(*b*) For the Pension Funds, to prolong by five years the age, and the duration of membership, required to qualify officers for retiring pensions: to reduce by a sixth the annuities to widows.
(*c*) For the Assistance Funds, to do away with optional grants, as well as those hitherto allowed during the first days of sickness.

By means of closing the Funds to new entrants, and provided that the measures above mentioned be adopted, the actuarial-financial position of the new Funds will be such that the accumulated deficit, for all the Funds both Pension and Assistance, would, on 31 December 1896 amount to 145,000,000 lires, and that on the average the annual receipts must be increased to the extent of 2·4 per-cent of the salaries of the members.

The new Institution which will have to be established for those servants who have joined the staff since 1 January 1897 is based upon

the system of individual accounts, with the double purpose of allowing the members to retain ownership in their own payments and the relative interest, and to limit the operation of mutual assurance to the incidental receipts of the two Funds, and to the contributions of the Management of the Railways when these, through the absence of heirs, have not been paid away.

This new Institution may be looked upon as illustrating the tendencies which, in this matter, appear to prevail with the Management of the great Railways, and in Government circles.

The annexed Table affords a comparison between the benefits offered by the new Institution and those which would be obtained from the existing Funds, where mutual assurance is complete.

It is right to add that organizations similar to the one we have just described, but perhaps with an even more drastic application of the principle of individual accounts, have already been adopted in Italy for the staffs of several Tramways, of some minor Railways, and of some other Boards, among others those of the Municipality of Turin and of the Bank of Italy.

It will probably not fail to be alleged that if such a system may be defended where limited Services are in question, where the staff cannot be numerous, that is not so in the case of great organizations having many employees. From the technical standpoint such criticism would be quite right. When we are conversant with the progress achieved by science, it is not permissible to neglect the application thereof. But in the great establishments of the Railways, it is not sufficient to adopt all the guarantees provided by science in order to obviate all risks, these being possibly bound up not only with the fall in the rate of interest, but also with the exigencies of progress in the Service with reference to traffic changes, in which case the Companies would not have the opportunity to throw these risks, even in part, on their staff; and so much the more as that staff, for the very reason that it is so numerous, would not readily consent to admit that which may be the eventual effect of certain stipulations, each time that the course of events results unfavourably towards them.

The masses use willingly the power which is theirs by virtue of numbers to claim rights, but they are not always so ready to fulfil their duties, even when these arise from a contract freely accepted. And the masses have unfortunately the means of making their power felt when they constitute one of the principal instruments of national welfare.

On the other hand it must not be forgotten that, for the very reason that the public administration of the Railways is so closely bound up with the general welfare of the country, and even with its safety, it is necessarily subject to direct interference on the part of the State. From this it follows that although that administration is entrusted to private companies, these are not less fettered by bureaucratic formalities which lend themselves but badly to the prompt carrying out of measures, even if only administrative, which might be rendered necessary by circumstances; so that, very often, notwithstanding the evident need for these measures, the evil may have rapidly increased before they can be put into operation.

In conclusion, if in the name of sound scientific principles, the

system of individual accounts might be adversely criticized, yet on the other hand, if regard be paid to the duties of many kinds which prudence imposes on the Management of a great Railway, the tendencies at present prevailing with these Railway Managements and in Government circles in Italy will be more than justified, in so far as they seek to reconcile the recognized interests of the Staffs with those of the Managements.

TABLE, *showing the Annual Amount of Pension provided by the Pension Funds and by the Assistance Funds to an Employee admitted at the Age of 25 Years.*

BENEFITS	AGE AT SUPERANNUATION					
	40–45	45–50	50–55	55–60	60–65	65–70
	Lires	Lires	Lires	Lires	Lires	Lires
I.—*Pension Funds.*						
(*a*) Under Present System*—						
Pensioners . . .	745	1,039	1,363	1,709	2,097	2,484
Widows of Pensioners .	447	623	818	1,025	1,258	1,490
Widows of Members dying in Active Service (With Children)	558	778	1,022	1,281	1,573	1,863
Widows of Members dying in Active Service (Without Children)	447	623	818	1,025	1,258	1,491
(*b*) Under the System of Individual Accounts—						
Pensioners . . .	687	984	1,321	1,684	2,089	3,240
Widows of Pensioners .	412	590	793	1,018	1,253	1,944
Widows of Members dying in Active Service (With Children)	313	496	762	1,132	1,737	2,620
Widows of Members dying in Active Service (Without Children)	235	371	569	844	1,293	1,258
II.—*Assistance Funds.*						
(*a*) Under Present System* .	235	319	395	471	554	632
(*b*) Under the system of Individual Accounts .	150	204	252	300	358	403

NOTE.—It is assumed that the commencing salary of a member admitted to the Pension Fund is Lires 1,200, and to the Assistance Fund Lires 685. Through increments, after 35 years of service, the former becomes trebled, while the latter in the same time rises to only Lires 900.

* The benefits are at present really greater; but they do not correspond to the resources available to the Funds, resources which formed the basis of calculation of the annuities spoken of above.

On the solution of some problems which frequently arise out of the Rules of Pension Funds and Friendly Societies. By H. W. Manly, *Actuary of the Equitable Life Assurance Society, London, and Vice-President of the Institute of Actuaries.*

Although the gambling instinct is inherent in human nature, in civilized and uncivilized tribes alike, and covers the whole period from youth to old age, it seems, at first, strange that all but an insignificant number refuse to speculate, as they term it, in their chances of living, by purchasing a deferred annuity (or old age pension, as it is fashionable to call it now); yet the benefits to the survivors—ease, comfort, independence—are enormous, compared with the small sacrifices which have to be made during the working part of a man's life, in order to secure them. The fact is, that the pleasure of gambling is found in the mental excitement which it produces, and, to secure that, the determination of the chances must be immediate. A long deferred chance has no excitement in it, but, on the contrary, often produces weariness and unrest. Thus it frequently happens that a man will cheerfully lose at play a sum which he would strongly protest that he could not afford to invest in providing for his own old age. He would argue that he might never live to be 60 or 65, and if he died before, he would have no chance of recouping his loss; but if he loses at play to-day, he will have the chance to-morrow, or next day, of recovering his loss, and of, perhaps, gaining something besides. There is no excitement in staking all upon one chance, and that chance not to be determined for years to come. As a consequence, none but a very few wise persons voluntarily purchase long deferred pensions.

Where large bodies of employees have been compelled to join some pension scheme, it has generally been found necessary, in order to prevent disaffection, to introduce the no-loss-under-any-circumstances element, so far as the men's contributions are concerned, by providing that the subscriber shall have his contributions returned to him or his heirs, whether he withdraws, or dies, or enters on his pension.

These schemes present many difficulties to the actuary, especially as hardly any two funds have exactly the same rules; and it is my object, in this paper, to show how some of the problems, which many of these rules present, can be mathematically solved.

I do not intend to discuss how these formulas can be brought into practical use, or what tables should be employed, or the proper mode of constructing them. The task would be far too long. I shall

content myself with giving the solutions, and working a few examples on the basis of the Institute of Actuaries' Text-Book Life Tables and 3 per-cent Interest, as that work, no doubt, is in the possession of every member of the Congress.

I will begin with the simplest problem, and then work gradually up to the more complicated ones.

Problem I.

What is the price of an immediate annuity of 1 on the life of (x), with the condition that if the life should die before the payments amount to the price given, the balance between the price given and the total annuity payments shall be returned?

Let P be the price.

Then it follows that it will be P years before the annuity payments equal the price given.

Now, it is evident that the difference between the price given and the accumulating payments of the annuity, must be insured.

We have, therefore:

$$l_x.\mathrm{P}=l_x a_x+\mathrm{P}d_x v+(\mathrm{P}-1)d_{x+1}v^2+(\mathrm{P}-2)\,d_{x+2}v^3+\ldots+(\mathrm{P}-\mathrm{P})d_{x+\mathrm{P}}v^{\mathrm{P}+1}$$

The last term being equal to 0 might have been omitted, but, for the purpose of producing a neat formula, it is inserted.

This, transformed into columnar notation, is—

$$\begin{aligned}\mathrm{D}_x\mathrm{P}&=\mathrm{N}_x+\mathrm{PC}_x+(\mathrm{P}-1)\mathrm{C}_{x+1}+(\mathrm{P}-2)\mathrm{C}_{x+2}+\ldots+(\mathrm{P}-\mathrm{P})\mathrm{C}_{x+\mathrm{P}}\\&=\mathrm{N}_x+\mathrm{P}(\mathrm{C}_x+\mathrm{C}_{x+1}+\mathrm{C}_{x+2}+\ldots+\mathrm{C}_{x+\mathrm{P}})\\&\qquad-(\mathrm{C}_{x+1}+2\mathrm{C}_{x+2}+3\mathrm{C}_{x+3}+\ldots\mathrm{PC}_{x+\mathrm{P}})\\&=\mathrm{N}_x+\mathrm{P}(\mathrm{M}_x-\mathrm{M}_{x+\mathrm{P}+1})-(\mathrm{R}_{x+1}-\mathrm{R}_{x+\mathrm{P}+1}-\mathrm{PM}_{x+\mathrm{P}+1})\\&=\mathrm{N}_x+\mathrm{PM}_x+\mathrm{R}_{x+\mathrm{P}+1}-\mathrm{R}_{x+1}\quad\ldots\ldots\ldots\quad(1)\\&\quad\therefore\ \mathrm{P}(\mathrm{D}_x-\mathrm{M}_x)=\mathrm{N}_x+\mathrm{R}_{x+\mathrm{P}+1}-\mathrm{R}_{x+1}\end{aligned}$$

and

$$\mathrm{P}=\frac{\mathrm{N}_x+\mathrm{R}_{x+\mathrm{P}+1}-\mathrm{R}_{x+1}}{\mathrm{D}_x-\mathrm{M}_x}\quad\ldots\ldots\quad(2)$$

This equation can only be solved by trial, as P cannot be eliminated from the suffix of R on the right-hand side. The solution, however, is not difficult.

Take, as an example, an annuity to be purchased at the age of 60; and let us find the value by the *Text-Book* table at 3 per-cent interest (p. 505).

a_{60} is 10·223, and we can imagine that the additional benefit will increase the value about 30 per-cent.

Try, first, P=13.

The value will then be $\dfrac{\mathrm{N}_{60}+\mathrm{R}_{74}-\mathrm{R}_{61}}{\mathrm{D}_{60}-\mathrm{M}_{60}}$

$$=\frac{102{,}106+17{,}032-73{,}314}{9{,}987{\cdot}6-6{,}722{\cdot}6}=\frac{45{,}824}{3{,}265}=14{\cdot}03,$$

so that P=13 is evidently not large enough.

Let us now take P = 14.

The value will be $\dfrac{N_{60}+R_{75}-R_{61}}{D_{60}-M_{60}}$

$$= \frac{102{,}106+14{,}465-73{,}314}{9{,}987{\cdot}6-6{,}722{\cdot}6} = \frac{43{,}257}{3{,}265} = 13{\cdot}25.$$

It will be noticed that the only value changed is that of R_{x+P+1}, and we could have deduced the second fraction from the first by adding ΔR_{74} to the numerator:

$$\Delta R_{74} = -M_{74} = -2{,}657, \text{ and } 45{,}824-2{,}567 = 43{,}257.$$

We have now got, for P = 13, value 14·03,
and for P = 14, „ 13·25.

from which we find that P = 13·58 gives a value 13·58.

We can prove this by substituting 13·58 for P in formula (2).

$$\frac{N_{60}+R_{74\cdot58}-R_{61}}{D_{60}-M_{60}}$$

$$= \frac{102{,}106+15{,}543-73{,}314}{3{,}265} = \frac{44{,}335}{3{,}265} = 13{\cdot}58.$$

These premiums can be loaded, provided the loading assumes the form of a percentage.

Suppose it is desired to load the premiums 10 per-cent. All that is necessary is to substitute 1·1P for P in the right-hand side of equation (1).

$$D_xP = N_x + 1{\cdot}1PM_x + R_{x+1\cdot1P+1} - R_{x+1}$$

$$P = \frac{N_x + R_{x+1\cdot1P+1} - R_{x+1}}{D_x - 1{\cdot}1M_x}.$$

Try P = 14 first. Then 1·1P = 15·4.

$$\frac{N_{60}+R_{76\cdot4}-R_{61}}{D_{60}-1{\cdot}1M_{60}}$$

$$= \frac{102{,}106+11{,}335-73{,}314}{9{,}987{\cdot}6-7{,}394{\cdot}9} = \frac{40{,}157}{2{,}592{\cdot}7} = 15{\cdot}48.$$

14 is evidently too small, so we will try P = 15, which we shall find gives a value of 14·67.

Then, as P = 14 gives a value of 15·48, and P = 15 gives a value of 14·67, we find that P = 14·81 will give a value of 14·81.

14·81 is a pure value, and by adding 10 per-cent we have 16·29 as the price which will give a loading of 10 per-cent on the net value.

Having found the price to be charged, the next thing to do is to find how to value the annuity at any time after it has been granted.

Scholium I.

To find the value of such an annuity at the end of t years, that is, immediately after the tth payment has been made.

Let V^t be the value at the end of t years.
Then we have—

$$D_{x+t}V^t = N_{x+t} + (P-t)C_{x+t} + (P-t-1)C_{x+t+1} + \ldots (P-P)C_{x+P}$$

$$= N_{x+t} + (P-t)(M_{x+t} - M_{x+P+1}) - \{R_{x+t+1} - R_{x+P+1} - (P-t)M_{x+P+1}\}$$

$$= N_{x+t} + (P-t)M_{x+t} + R_{x+P+1} - R_{x+t+1}$$

and $$V^t = \frac{N_{x+t} + (P-t)M_{x+t} + R_{x+P+1} - R_{x+t+1}}{D_{x+t}} \quad \ldots\ldots\ldots \quad (3)$$

When $t=0$ we have $V^0 = (N_x + PM_x + R_{x+P+1} - R_{x+1}) \div D_x = P$.

When $t=P$ we have $V^P = \frac{N_{x+P}}{D_{x+P}}$, which is the value of the annuity immediately the total payments amount to the purchase price.

Example.—Let it be required to find the value of such an annuity purchased at the age of 60, immediately after the fifth payment.
P is now known to be 13·58, and making $x+t=65$ we have

$$V^5 = \frac{N_{65} + (13{\cdot}58-5)M_{65} + R_{61+13{\cdot}58} - R_{66}}{D_{65}}$$

$$= \frac{60{,}605 + 44{,}993 + 15{,}543 - 48{,}106}{7{,}219{\cdot}5} = \frac{73{,}035}{7{,}219{\cdot}5} = 10{\cdot}12.$$

When a loaded premium is charged, the loaded premium must be used in the formula, but it must be clearly borne in mind that the value obtained is a pure value, and that some arrangement should be made for reserving a part of the loading, as in the case of paid-up policies.

Scholium II.

If the return of only half the purchase price is guaranteed, we shall have

$$D_x P = N_x + \tfrac{1}{2}PM_x + R_{x+\frac{1}{2}P+1} - R_{x+1}$$

and $$P = \frac{N_x + R_{x+\frac{1}{2}P+1} - R_{x+1}}{D_x - \frac{1}{2}M_x} \quad \ldots\ldots\ldots \quad (4)$$

and for an annuity of 1 at age 60 with such a condition, it will be found that the price P=11·175.

Problem II.

What is the price of an annuity of 1 on the life of (x) to commence at the age of $(x+n)$, with the condition that no money is to be returned in the event of death before age $(x+n)$, but if death occurs after the annuity is entered upon, and before the annuity payments amount to the price given, the balance between the price given and the total annuity payments shall be returned?

This being simply the benefit provided in Problem I deferred (n) years, we have only to convert the (x)'s on the right-hand side of the equation (1) into $(x+n)$'s—

$$PD_x = N_{x+n} + PM_{x+n} + R_{x+n+P+1} - R_{x+n+1}$$

and

$$P = \frac{N_{x+n} + R_{x+n+P+1} - R_{x+n+1}}{D_x - M_{x+n}} \quad . \quad . \quad . \quad . \quad . \quad (5)$$

PROBLEM III.

What is the price of an annuity of 1 on the life of (x), to commence at the age of $(x+n)$, with the condition that the money shall be returned in the event of death before age $(x+n)$; but if death occurs after the annuity is entered upon, and before the annuity payments amount to the price given, the balance shall be returned ?

Here the benefit is the same as Problem II, with the addition of the assurance of the return of P in the event of death during (n) years.

Hence $D_x P = N_{x+n} + P(M_x - M_{x+n}) + PM_{x+n} + R_{x+n+P+1} - R_{x+n+1}$

and

$$P = \frac{N_{x+n} + R_{x+n+P+1} - R_{x+n+1}}{D_x - M_x} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (6)$$

EXAMPLE.—Let $x=30$ and $x+n=60$.

As $\frac{N_{60}}{D_{30}}$ is 2·763, we may assume that the value of P will be between 3 and 4.

Try P=3 first:

Then we have

$$\frac{N_{60} + R_{64} - R_{61}}{D_{30} - M_{30}} = \frac{102{,}106 + 58{,}896 - 73{,}314}{36{,}949 - 14{,}462} = \frac{87{,}688}{22{,}487} = 3{\cdot}9.$$

For P=4 we have $\frac{82{,}143}{22{,}487} = 3{\cdot}653,$

and from these two values we ascertain that P=3·722 will give a value 3·722.

Scholium.

To ascertain the value of the above annuity at the end of (t) years, the formula will be—

(1) When t is less than n,

$$V^t = \frac{N_{x+n} + PM_{x+t} + R_{x+n+P+1} - R_{x+n+1}}{D_{x+t}} \quad . \quad . \quad . \quad . \quad (7)$$

(2) When t is greater than n and less than $(n+P)$

$$V^t = \frac{N_{x+t} + (n+P-t)M_{x+t} + R_{x+n+P+1} - R_{x+t+1}}{D_{x+t}} \quad . \quad . \quad (8)$$

(3) When t is equal to or greater than $(n+P)$, we have

$$V^t = \frac{N_{x+t}}{D_{x+t}}.$$

Problem IV.

What is the annual premium, payable for n years, for an annuity of 1 on the life of (x), to commence at the age of $(x+n)$, with the condition that no money shall be returnable in the event of death before age $(x+n)$, but if death occurs after the annuity is entered upon, and before the annuity payments amount to the total premiums paid, the balance shall be returned?

If P be the annual premium, then the total premiums paid will be nP.

Then, making the proper substitutions in the values in Problem II, we have—

$$(N_{x-1}-N_{x+n-1})P=N_{x+n}+nPM_{x+n}+R_{x+n+nP+1}-R_{x+n+1}$$

and

$$P=\frac{N_{x+n}+R_{x+n+nP+1}-R_{x+n+1}}{N_{x-1}-N_{x+n-1}-nM_{x+n}} \quad . \; . \; . \quad (9)$$

Problem V.

What is the annual premium, payable for n years, for an annuity of 1 on the life of (x), to commence at the age of $(x+n)$, with the condition that if death occurs before the annuity commences, all the premiums paid shall be returned, and if death occurs after the annuity commences, but before the annuity payments amount to the total premiums paid, the balance shall be returned?

Here we have the same benefit as in Problem IV, with the addition of an increasing assurance of P for n years, and, consequently,

$$(N_{x-1}-N_{x+n-1})P=N_{x+n}+P(R_x-R_{x+n}-nM_{x+n})+nPM_{x+n}$$
$$+R_{x+n+nP+1}-R_{x+n+1}$$

and

$$P=\frac{N_{x+n}+R_{x+n+nP+1}-R_{x+n+1}}{(N_{x-1}-N_{x+n-1})-(R_x-R_{x+n})} \quad . \; . \; . \; . \; . \quad (10)$$

It will be noticed that in all these formulas the variation in form is always in the denominator.

Example.—Let $x=30$, and $x+n=60$.

Then, since $N_{60}\div(N_{29}-N_{59})=\cdot1547$, and as it may be guessed that the increase will be about 30 per-cent, we will try first P$=\cdot2$: nP will, therefore, be 6.

$$P=\frac{N_{60}+R_{67}-R_{61}}{(N_{29}-N_{59})-(R_{30}-R_{60})}=\frac{102{,}106+43{,}166-73{,}314}{(772{,}053-112{,}094)-(406{,}696-84{,}037)}$$

$$=\frac{71{,}958}{337{,}300}=\cdot213.$$

P$=\cdot2$ is not large enough, so let us try P$=\cdot21$. Then nP$=6\cdot3$, and the above numerator will be diminished by $\cdot3M_{67}$

$$P=\frac{71{,}958-1{,}391}{337{,}300}=\cdot2092.$$

Then, as P$=\cdot2$ gives a value of $\cdot213$, and P$=\cdot21$ gives a value of $\cdot2092$, we find that the true value of P is between $\cdot2094$ and $\cdot2095$.

These premiums (as in all the other cases) may be loaded, if the loading assumes the form of a percentage. Suppose we want to load the above premium 10 per-cent, then we have

$$(N_{x-1}-N_{x+n-1})P=N_{x+n}+1{\cdot}1P(R_x-R_{x+n})+R_{x+n+1{\cdot}1nP+1}-R_{x+n+1}$$

and

$$P=\frac{N_{x+n}+R_{x+n+1{\cdot}1nP+1}-R_{x+n+1}}{(N_{x-1}-N_{x+n-1})-1{\cdot}1(R_x-R_{x+n})} \quad . \quad . \quad . \quad (11)$$

If we try P=·22, then nP=6·6 and 1·1nP=7·26.

$$P=\frac{N_{60}+R_{68\cdot26}-R_{61}}{(N_{29}-N_{59})-1{\cdot}1(R_{30}-R_{60})}=\frac{66,195}{305,034}=\cdot217.$$

If we try P=·21, then 1·1nP=6·93, and we have

$$P=\frac{67,646}{305,034}=\cdot2218.$$

From which two values we find the true value of P=·218, and, adding 10 per-cent, we find the loaded premium to be ·2398.

Scholium I.

If the problem is varied, so that the return of only half the premiums is to be guaranteed, either on previous death or after the annuity is entered upon, the equation will be—

$$(N_{x-1}-N_{x+n-1})P=N_{x+n}+\tfrac{1}{2}P(R_x-R_{x+n})+R_{x+n+\frac{1}{2}nP+1}-R_{x+n+1} \quad . \quad (12)$$

and

$$P=\frac{N_{x+n}+R_{x+n+\frac{1}{2}nP+1}-R_{x+n+1}}{(N_{x-1}-N_{x+n-1})-\frac{1}{2}(R_x-R_{x+n})} \quad . \quad . \quad . \quad . \quad . \quad (13)$$

Example.—Let x=30 and $x+n$=60 as before. Try P=·18 first. $\frac{1}{2}n$P=2·7.

Then we have

$$P=\frac{N_{60}+R_{63\cdot7}-R_{61}}{(N_{29}-N_{59})-\frac{1}{2}(R_{30}-R_{60})}$$

$$=\frac{102,106+60,649-73,314}{659,959-161,330}=\frac{89,441}{498,629}=\cdot17937.$$

If now we put P=·17, the value will be ·18113, and from these two values we find the true value of P to be ·17946, which is less than the mean between the value of P for the simple reversionary annuity (·1547) and the value when the return of all the premiums is guaranteed (·2094).

This premium can be loaded by a percentage as shown in formula (11).

Scholium II.

The last case—where the return of half the premium is guaranteed—being the most common, I will investigate the formula for valuing the contract at the end of t years; and as it is essential that we should consider the case where the premium is loaded, we will call the loaded premium P′.

(i) When $t=0$.

From formula 12 we have

$$D_x V^0 = \{N_{x+n} + \tfrac{1}{2}P'(R_x - R_{x+n}) + R_{x+n+\frac{1}{2}nP'+1} - R_{x+n+1}\} - P(N_{x-1} - N_{x+n-1}) = 0 \quad . \quad . \quad (14)$$

(ii) When t is less than n.

We must now remember that t premiums have been paid, and, consequently, half of them must be insured, as well as half the future premiums; and so we have

$$D_{x+t} V^t = \{N_{x+n} + \tfrac{1}{2}tP'M_{x+t} + \tfrac{1}{2}P'(R_{x+t} - R_{x+n}) + R_{x+n+\frac{1}{2}nP'+1} - R_{x+n+1}\} - P(N_{x+t-1} - N_{x+n-1}) \quad . \quad . \quad . \quad . \quad . \quad . \quad (15)$$

(iii) When $t=n$ we have

$$D_{x+n} V^n = N_{x+n} + \tfrac{1}{2}nP'M_{x+n} + R_{x+n+\frac{1}{2}nP'+1} - R_{x+n+1} \quad . \quad . \quad (16)$$

(iv) When t is greater than n and less than $n+\frac{1}{2}nP'$.

$$D_{x+t} V^t = N_{x+t} + (n + \tfrac{1}{2}nP' - t)M_{x+t} + R_{x+n+\frac{1}{2}nP'+1} - R_{x+t+1} \quad . \quad (17)$$

(v) When $t = n + \frac{1}{2}nP'$ all the values on the right-hand side vanish except N_{x+t}, and generally

(vi) When t is equal to or greater than $n + \frac{1}{2}nP'$,

$$V^t = \frac{N_{x+t}}{D_{x+t}} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (18)$$

Further developments of these problems, such as the introduction of a return of the whole or a portion of the premiums on withdrawal from the fund, or the addition of simple or compound interest to the whole or portion of the premiums on their return in the event of death before entering on the annuity, require the preparation of special tables. I, therefore, do not intend to go into those questions now, particularly as it would be impossible to construct a table which would suit every kind of fund.

Enough has been done to show that many of these problems are capable of an exact solution; and, although it is not to be supposed that they would be used in a valuation, yet I venture to hope that they will be found useful in making adjustments when close approximations to correct values are required.

Discussion *of Papers on Old Age Pensions.*

When all the foregoing papers had been submitted, the President (Mr. Young) invited discussion.

M. Georges Patel (France) said:—

I think it desirable to call attention to certain passages in the Paper of M. Duplaix on Old Age Pensions, from which it might be inferred that the National Old Age Pension Fund shows a deficiency. While I feel quite sure that the distinguished author of the Paper referred to has not for a moment intended to cast any discredit on the great Institution which I have the honour to represent here, yet I think that some explanation is necessary. I shall be brief, not wishing to waste precious time at this last meeting, which is to close the Congress.

As has been stated, the National Pension Fund still calculates at 3½ per-cent interest by the table C.R. the life annuities granted to its depositors, and, I will add that it charges them with only net premiums, free of all loading.

I frankly admit that an assurance company working in like manner would find each year a growing deficiency in its accumulations, and would hasten by rapid strides towards ruin. But we must not confound the Institution of which we speak with private companies. We must not lose sight of the fact that it operates under special conditions, and I maintain that it can survive and prosper, while yet it offers to its *clientèle* advantages which appear at first sight dangerous to the assurer.

It should be noted that the National Pension Fund, having no agents, has no commission to pay; nor dividends, because it knows nothing of share-holders. There is nothing commercial in its aims, and its privileged position

Je crois devoir appeler votre attention sur certains passages du Rapport de M. Duplaix sur les Pensions de Retraites qui pourraient peut être vous amener à conclure que la Caisse Nationale des Retraites pour la Vieillesse est en déficit. Bien que je sois absolument convaincu que l'auteur distingué du Rapport auquel je fais allusion, n'a pas songé un seul instant à jeter le discrédit sur la grande Institution que j'ai l'honneur de répresenter ici, j'estime qui certaines explications sont nécessaires. Je serai bref, ne voulant pas abuser d'un temps précieux au cours de cette dernière séance qui va clore la session.

Comme on vous l'a dit, la Caisse Nationale des Retraites calcule encore aujourd'hui à l'aide du tarif 3½ % C.R. les rentes viagères à servir à ses déposants; et j'ajouterai qu'elle leur demande seulement des primes mathématiques, exemptes de tout chargement.

Je reconnais volontiers qu'une compagnie d'assurances opérant de la même façon verrait chaque année s'accroître le déficit de ses réserves, et s'acheminerait à grands pas vers la ruine. Mais, il ne faut pas confondre l'Institution qui nous occupe avec les compagnies privées. Nous ne devons pas perdre de vue qu'elle fonctionne dans des conditions spéciales, et j'affirme qu'elle peut vivre et prospérer en offrant à sa clientèle des avantages qui semblent, à première vue, dangereux pour l'assureur.

Veuillez remarquer que la Caisse Nationale des Retraites, n'ayant pas de courtiers, n'a pas de commissions à

permits it to guarantee, in the calculation of its reserves, the gross amount of the sums which are entrusted to it, less, nevertheless, the expenses of management, which are exceedingly moderate, as I shall show in a moment.

In the year 1896, the ordinary expenses amounted to fcs. 942,618.73. It would be difficult to conceive of more economical management when it is remembered that the National Old Age Pension Fund received during that year more than 1,800,000 payments; that it kept the accounts of more than 500,000 depositors whose annuities had not yet matured; and that it paid about 33,500,000 francs in quarterly annuities to its pensioners, who numbered more than 200,000.

The National Old Age Pension Fund does not show a deficit, and it can carry on its business, depending on its own resources, without the State having to undertake the smallest sacrifice for its assistance.

To make this clear, it is sufficient to glance at the report of its Chief Committee, presented in 1897 to the President of the Republic, on the operations and the position of that Fund.

This report shows that on 31 December 1896—

The assets amounted to..	Fcs. 823,067,260.61
While the liabilities were only	798,798,756.75
So that there is brought out a surplus of ...	Fcs. 24,268,503.86

of assets over liabilities on 31 December 1896.

I beg of you to notice that the above-mentioned assets were valued at the rate of 4 per-cent, and the liabilities at the rate of $3\frac{1}{2}$ per-cent corresponding to the tables of premiums actually in use. This method of valuation has for result to bring out assets smaller than they really are; and I may say, without fear of contradiction, that the National Old Age Pension Fund possesses reserves greater by at least 25,000,000 francs than its liabilities; and that it may, without endangering the future, payer, pas plus que de dividendes, puisqu'elle ne connait pas les actionnaires. Son but n'a rien de commercial, et sa situation priviligiée lui permet d'affecter, à la constitution de ses réserves, l'intégralité des sommes qui lui sont confiées, sous déduction cependant de ses frais administratifs qui sont extrêmement réduits, ainsi que je vais vous le faire constater.

Pour l'année 1896, ces frais se sont normalement élevés à fcs. 942,618.73.

Il semble difficile de concevoir une gestion plus économique si l'on veut se rappeler que le Caisse Nationale des Retraites pour la Vieillesse a reçu, au cours de cette année, plus de 1,800,000 versements, qu'elle a tenu les comptes de plus de 500,000 déposants dont les rentes ne sont pas encore échues, et payé environ 33,500,000 francs de rentes trimestrielles à ses rentiers, dont le nombre excède 200,000.

La Caisse Nationale des Retraites pour la Vieillesse n'est pas en déficit, et elle peut fonctionner à l'aide de ses propres ressources, sans que l'Etat ait à s'imposer le moindre sacrifice pour lui venir en aide.

Pour s'en convaincre, il suffira de jeter un coup d'œil sur le Rapport de sa Commission Supérieure, adressé en 1897 au Président de la République, sur les opérations et la situation de cette Caisse.

Ce Rapport établit qu'au 31 Décembre 1896 l'actif s'élevait à Fcs. 823,067,260.61

Alors que le passif était seulement de 798,798,756.75

Ce que fait ressortir à ... ... Fcs. 24,268,503.86

l'excédent de l'actif sur le passif au 31 Décembre 1896.

Je vous prie d'observer que l'actif ci-dessus a été évalué au taux 4 % et le passif au taux $3\frac{1}{2}$ % correspondant au tarif actuellement en vigueur. Ce mode d'évaluation a pour conséquence de faire apparaître un actif inférieur à la réalité, et je crois pouvoir dire, sans craindre un démenti, que la Caisse Nationale des Retraites pour la Vieillesse possède des réserves supérieures d'au moins 25 millions à la valeur de ses engagements, et qu'elle peut, sans com-

ignore the question of working expenses in calculating its tables of premiums.

To complete the Paper of M. Duplaix, I shall close with a brief analysis of the law relating to the supplementing of life annuities.

With the view of encouraging thrift and workmen's pensions, the law of 31 December 1895 enacted that the supplementing of life annuities should be granted indiscriminately to the pensioners of the National Pension Fund, and to those of Friendly Societies, and Mutual Aid and Provident Societies, which fulfilled certain conditions as to age and length of membership and independent income.

These supplementary annuities may not exceed one-fifth of the annuities to be so increased.

To be entitled to share in the benefits of the law, the applicant must—

1. Be a French subject;
2. Be the possessor of a book with the National Pension Fund, or be a pensioner of a friendly society, or of any other mutual aid or provident society;
3. Be at least 70 years of age;*
4. Have made payments to the National Old Age Pension Fund, or paid regular contributions to the society which provides the pension, for 25 years, whether consecutive or not. As a temporary measure, and for a period of 10 years, starting from 1895, the number of years of thrift required of each pensioner is reduced as follows:—15 years for the claimants of supplemental pensions entered in 1895; 16 years for those entered in 1896; and so on, one year being added for each year up to 1905, when the condition of 25 years will be applicable to all;
5. Not possess, inclusive of the annuity which is the basis of the application for the supplemental grant, a personal income, whether life or other, exceeding 360 francs;
6. Not have shared in the supple-

* By the Finance Act of 13 April 1898, the supplemental pensions may be granted as from 68 years of age.

promettre l'avenir, négliger de tenir compte, dans l'établissement de ses tarifs, de ses frais de gestion.

Pour compléter le Rapport de M. Duplaix, je terminerai par une analyse succinte de la loi relative à la majoration des rentes viagères.

Dans le but d'encourager la prévoyance et les retraites ouvrières, la loi du 31 Décembre 1895 a décidé que des majorations de rentes viagères seraient accordées indistinctement aux rentiers de la Caisse Nationale des Retraites, aux pensionnaires des Sociétés de Secours Mutuels, ou des Sociétés de Secours et de Prévoyance qui remplissent certaines conditions, au point de vue de l'age, de la continuité des versements, et de la situation de fortune.

Ces rentes supplémentaires ne peuvent excéder le cinquième de la rente à majorer.

Pour être admis à bénéficier des avantages de la loi, il faut:

1° être Français;
2° être titulaire d'un livret de la Caisse Nationale des Retraites, ou pensionnaire d'une Société de Secours Mutuels ou de toute autre Société de Secours et de Prévoyance;
3° être agé d'au moins 70 ans; (1)
4° avoir effectué des versements à la Caisse Nationale des Retraites pour la Vieillesse, ou payé des cotisations régulières à la Société qui a constitué la pension, pendant 25 années consécutives ou non. A titre transitoire et pendant une période de 10 années, à partir de 1895, le nombre d'années de prévoyance exigé de chaque pensionnaire est abaissé ainsi qu'il suit: 15 ans pour les demandes de bonification souscrites en 1895, 16 ans pour celles souscrites en 1896 et ainsi de suite, en exigeant une année de plus à chaque nouvel exercice jusqu'en 1905, date à laquelle la condition de 25 ans deviendra exigible pour tous.
5° ne pas jouir, y compris la rente qui fait l'objet de la demande de

(1) En exécution de la loi de finances du 13 Avril 1898, les majorations pourront être accordées à partir de 68 ans.

mental grants of the preceding years.

Besides the ordinary supplementary pensions, special grants may be made to those who prove that they have brought up more than three children.

In consequence of this law, two credits of 2,000,000 francs each have been included in the budgets of 1895 and 1896, and have permitted of the grant, to each of those entitled, of the maximum supplementary pension, that is, 20 per-cent of the annuities supplemented.

The total credit of 4,000,000 francs has not been disbursed, and the balance remaining, amounting to nearly 2,000,000 francs, has been repaid to the Public Treasury.

To meet the expenditure consequent on the applications made in 1897, there was inserted in the budget a credit of 1,200,000 francs, which appears to have been nearly all spent, the supplementary pensions being claimable as from 68 years of age.

I hope that this brief statement will suffice to show that the National Old Age Pension Fund is in a prosperous condition, and that, without ever having to require subsidies from the State which guarantees it, it will be able, in the future as in the past, to render the greatest service to French thrift.

majoration, d'un revenu personnel, viager ou non, supérieur à 360 francs ;

6° n'avoir pas participé aux majorations des années précédentes.

En outre de la majoration ordinaire, des bonifications spéciales peuvent être accordées aux pensionnaires qui justifieront avoir élevé plus de trois enfants.

A la suite de cette loi, deux crédits de 2 millions chacun ont été inscrits aux budgets des années 1895 et 1896, et ont permis d'allouer à tous les ayants droit la majoration maxima, soit 20 °/₀ de la rente à bonifier.

Le crédit total de 4 millions n'a pu être employé, et le solde disponible, représentant près de 2 millions, a été reversé au Trésor public.

Pour faire face aux dépenses correspondant aux demandes souscrites en 1897, il à été inscrit au budget un crédit de 1,200,000 francs qui semble devoir être presque intégralement absorbé, les majorations pouvant être accordées à partir de 68 ans.

J'espère que ce rapide exposé suffira pour établir que la Caisse Nationale des Retraites pour la Vieillesse est dans une situation prospère, et que, sans avoir jamais recours aux subsides de l'Etat qui lui donne sa garantie, elle pourra, dans l'avenir comme par le passé, rendre les plus grands services à la Prévoyance française.

M. Louis Weber (France) said :—

The Labour Bureau has collected interesting statistics regarding old age pensions among those engaged in industrial pursuits. In industrial employments, a large number of Pension Funds have been established, thanks to the initiative of the employers. The Labour Bureau has obtained particulars of about 200 of such private Funds, established in industrial works, and having a membership, in round figures, of about 100,000 workmen, not including mines and the transport industry, which employ 540,000 workmen, of whom 65 per-cent belong to Pension Funds.

These 200 Funds are of two

L'Office du Travail a entrepris des statistiques intéressantes relatives aux pensions de vieillesse dans l'industrie. Dans l'industrie, un assez grand nombre de Caisses de pensions ont été constituées, grâce à l'initiative des patrons. L'Office du Travail a obtenu des statistiques de 200 environ de ces Caisses privées fondées par des établissements industriels et comptant 100,000 ouvriers en chiffres ronds, non compris les mines et les entreprises de transport, qui embrassent ensemble 540,000 ouvriers, dont 65 pour cent sont affiliés à des Caisses de Retraite. Ces 200 Caisses appartiennent à deux types différents: celles du 1er type, dont la majeure partie fonction-

different types. Those of the first type, the majority of which proceed without any thought of actuarial principles, themselves provide the pensions. The others, 95 in number, confine themselves to collecting the moneys, and handing them over to the National Pension Fund.

One of the Funds of the first type, the Employers' Fund of the Iron Works of France, is worthy of a moment's attention. Founded upon a rational basis, it includes 7,000 members belonging to 15 different firms.

The law of 27 December 1895 places these Funds under severe regulations, which will perhaps interfere with the development of Employers' Funds, but which will have for effect the enrolling of the workmen with the National Pension Fund, and with assurance companies.

It is this latter system which seems to be preferred. The great railway companies seem disposed to assure themselves with the National Pension Fund, which is actually paying 34,000,000 francs in annuities to 225,000 annuitants.

nent sans souci des règles techniques, constituent elles-mêmes les pensions; les autres, au nombre de 95, se bornent à servir d'intermédiaires pour recueillir les fonds et les verser à la Caisse Nationale des Retraites.

L'une des Caisses ressortissant de la 1re catégorie, la Caisse Patronale des Forges de France, mérite qu'on s'y arrête un instant. Constituée d'une façon rationnelle, elle compte 7,000 membres appartenant à 15 firmes différentes.

La loi du 27 Décembre 1895 soumet ces Caisses à un régime assez sévère, qui retardera peut-être le développement des Caisses patronales, mais qui aura pour effet d'amener l'affiliation des ouvriers à la Caisse Nationale des Retraites ou aux Compagnies privées d'assurances.

C'est ce dernier système qui parait préféré; les grandes entreprises de chemin de fer semblent disposées à s'assurer à la Caisse des Retraites, qui sert actuellement 34,000,000 f. d'arrérages viagers à 225,000 rentiers.

Dr. Sestilli (Italy), with regard to his own paper and those of MM. Rainaldi and Benedetti, said—

The Italian Association of Actuaries, when accepting the invitation of the Organizing Committee of the present Congress to the actuaries of different countries, decided to present to the Congress Papers on the various questions proposed, and on the apparent tendencies in Italy. But, seeing that the Association was formed only quite recently, time was wanting to prepare complete reports. We had to limit the work to just a few questions, and, moreover, we had to examine these from only some of their sides. And, besides, time did not permit of the Papers which were prepared being printed.

In so far as Old Age Pensions are concerned, M. Rainaldi has written on Civil and Military State Pensions, and M. Benedetti on the Pensions of the employees of Railway Companies. These gentlemen are not present, and I shall say a few words on their papers in my capacity as Secretary of the Italian Association of Actuaries.

L'Association Italienne d'Actuaires, acceptant l'invitation du Comité Organisateur du présent Congrès faite aux actuaires des différents pays, a décidé de présenter au Congrès des rapports sur les questions proposées, et sur les tendences qui paraissent prévaloir en Italie. Mais comme l'Association n'a éte constituée que tout récemment, le temps a manqué pour préparer des rapports complets. Nous avons dû borner le travail à quelques questions seulement, et encore n'avons nous pu les envisager que de quelques côtés seulement: au surplus, le temps a fait défaut pour imprimer les rapports élaborés.

En ce qui concerne les pensions de vieillesse, M. Rainaldi a rapporté sur les pension civiles et militaires de l'Etat, et M. Benedetti sur les pensions des employés des chemins de-fer. Ces Messieurs ne sont pas présent, et je dirai quelques mots de leurs rapports en ma qualité de Secrétaire de l'Association Italienne d'Actuaires.

For State Pensions, there do not exist with us Funds to receive the deductions from the salaries of the employees, and the contributions of the State, and to pay the pensions. There is no provision for the accumulation of capital to provide the annuities. On the expenditure side of the annual budget, the estimated amount of the pensions of the year is entered, and among the receipts, the amount deducted from salaries. The amount of pension is not arrived at rationally, because it is independent of the age, being a function of the number of years of service and of the salary at the time of superannuation. It is not intended that this system shall endure much longer, Government having undertaken to Parliament to submit a Bill to organize a Provident Fund, whose operations will be similar to those of assurance companies.

As to the pensions of railway servants, several Funds exist, of which the financial condition is unsound. From examinations which have been made, it appears that there is a considerable deficit, and that that is always growing. The remedies required being of an urgent nature, a reduction of charge and an increase of income have already been arranged for, but a definite settlement has not yet been arrived at. A Bill has been submitted to the Chamber of Deputies, and the discussion thereof is expected immediately.

Along with these two Papers, I have the honour to lay on the table a memorandum which I have prepared on the Bill which has already passed the Chamber of Deputies, but which has still to be approved by the Senate.

Pour les pensions de l'Etat il n'existe pas chez nous de caisse destinée à recevoir les retenues faites aux employés et les contributions de l'Etat, et à pourvoir au payement des pensions. Ou ne pourvoit pas à l'accumulation du capital constitutif de la rente. On inscrit parmi les dépenses dans le bilan annuel le montant présumable des pensions à payer pendant l'année, et parmi les recettes le montant des retenues. Le montant de la pension n'est pas rationellement déterminé, parce qu'il est indépendant de l'age. Il est fonction du nombre d'années de service accompli et du traitment au moment de retraite. Ce système n'est pas destiné à rester encore longtemps en vigueur : le Gouvernement s'est engagé, vis-à-vis du Parlement, à présenter un projet de loi relatif à l'organisation d'une Caisse de prévoyance, dont le fonctionment sera similaire à celui des compagnies d'assurances.

En ce qui concerne les pensions des employés des chemins de fer, plusieurs caisse existent, dont la situation financière est mauvaise. Des études qui ont été faites, il résult que le déficit est considérable, et qu'il augmente toujours, Les remèdes à apporter présentant un caractère d'urgence, on a déja pourvu à la diminution des charges et à l'augmentation des recettes. Toutefois la solution définitive n'est pas encore intervenue. Un projet de loi a été présenté à la Chambre des Députés, et on en attend actuellement la discussion.

Concurrement avec ces deux rapports, j'ai l'honneur de déposer sur le Bureau une Note que j'ai rédigée sur le projet de loi qui a déja été approuvé par la Chambre des Députés, mais qui attend encore l'approbation du Sénat.

M. Landré (Holland) said that in Holland there existed a Government Commission on Old Age Pensions, which was established in 1895, and of which he was a member. A draft Bill had been prepared, of which he would send a copy to the Permanent Committee.

M. Pokotiloff (Russia) said that it would be interesting to have formulas like those of Mr. Manly, only extended so as to take into account not only mortality and interest, but also disablement from work.

M. Lèon Marie (France) said that :—

In his opinion, the intervention of the State in the matter of pensions must be very cautious. In France, the

A son avis, l'intervention de l'Etat, en matière de pensions, doit être très discrète. En France, la question de

question of such intervention has been discussed for the past two years, in the search for means to prevent pensions provided by employers from disappearing should the employer become bankrupt. The law of 27 October 1895, solved the problem, at least in appearance, because it renders compulsory the paying over the funds intended to provide the pension to State Department, or to certain private institutions under State control. But this law has had very unfortunate effects on the development of employers' Funds.

Two systems for Old Age Pensions are before us, the obligatory system, and the system of liberty. The former, which necessarily implies the direct intervention of the State, is not capable of producing an equitable solution. In fact, the State cannot take account of the various circumstances of locality, occupation, means, cost of living, age at which a pension becomes indispensable, &c. The numberless cases that would present themselves, could not all be provided for by one law. The speaker thought that, consequently, the obligatory system must *a priori* be rejected, He, nevertheless, was of opinion that the State must not entirely ignore the question, but that it could intervene by making a charge in the budget to encourage the efforts made by the employers or by the workmen themselves to place the old age of the a tter beyond the reach of misery.

The obligatory system being thus rejected, there remains the system of liberty. Under such a system, application may be made either to the State Fund or to private Companies. Also independent Employers' Funds may be established. According to M. Marie, the State Fund does not, on the whole, give a satisfactory solution, because in the first place its rules are lacking in elasticity, and also because the granting of very numerous old age pensions by the State Fund would lead to the accumulation in its hands of large sums of money. M. Marie declared his preference for private Companies and independent Funds. Doubtless, these last have laid themselves open to criticism from the actuarial point of

cette intervention a été agitée il y a deux ans, alors qu'on recherchait les moyens d'empêcher que les pensions patronales ne disparaissent quand le patron devient insolvable. La loi du 27 Octobre 1895 a résolu le problème, au moins en apparence, car elle rend obligatoire le dépôt des fonds destinés à la retraite dans les Caisses de l'Etat, ou dans certaines caisses privées soumise au contrôle de l'Etat. Mais cette loi a produit de très fâcheux effets sur le développement des institutions patronales.

Deux systèmes sont en présence pour la constitution des retraites; le système de l'obligation, et celui de la liberté. Le premier, qui comporte nécessairement l'intervention directe de l'Etat, ne saurait constituer une solution équitable; en effet, l'Etat ne peut pas tenir compte des diverses circonstances de région, de profession, des resources, de cherté de vie, d'âge auquel la pension devient indispensable, &c. Les cas si multiples qui peuvent se présenter ne sauraient être prévus par une loi. L'orateur estime en conséquence qu'il faut rejeter à priori le système de l'obligation. Il est toutefois d'avis que l'Etat ne doit pas se désintéresser complètement de la question, et qu'il pourrait intervenir en employant une partie de son budget pour encourager les efforts faits par les patrons ou par les ouvriers eux-mêmes, en vue de mettre la vieillesse de ces derniers à l'abri de la misère.

Le système de l'obligation étant écarté, il reste le système de la liberté. Sous un tel régime, on peut s'adresser, soit à la Caisse de l'Etat, soit aux Compagnies particulières. On peut aussi fonder des Caisses patronales autonomes. D'après M. Marie, la Caisse de l'Etat ne donne généralement pas une solution satisfaisante, d'abord parce que les dispositions de ses statuts manquent d'élasticité; ensuite parce que la constitution de très nombreuses pensions de retraite à la Caisse de l'Etat aurait pour effet d'accumuler dans ses coffres des sommes considérables. M. Marie avoue ses préférences pour les Companies particulières, et les Caisses autonomes. Sans doute, celles-ci ont pu prêter le flanc à certaines critiques

view, but many employers have already seen their mistake, and have applied to the actuaries under whose advice the future of the Funds may be looked forward to with entire confidence. Where large industrial or commercial establishments are concerned, counting their employees by thousands, these Funds may be worked purely by the employers, that is, may be attached specially to a particular establishment. But where the establishments, on the contrary, are smaller, and employ fewer men, the plan of a syndicate of establishments is evidently convenient. Lastly, in the case of the small employer, having only one or two workmen or clerks, the private Companies supply the best solution.

Examining the question of accumulation or assessment, M. Marie thought that the system of assessment could not be conceived of except under the condition of assurance universally obligatory, and also immediate; while under any other conditions the system of accumulation is unavoidable.

au point de vue actuariel, mais beaucoup de patrons se sont aperçus déjà de leur erreur, et sont venus aux actuaires, dont l'intervention permet d'envisager avec sérénité l'avenir des caisses en question. Lorsqu'il s'agit de grands établissements industriels ou commerciaux, comptant leurs salariés par milliers, ces caisses peuvent être purement patronales, c'est à dire spéciales à chaque entreprise. Dans le cas où les établissements sont moins importants, et pourvus d'un personel moins nombreux, c'est la forme syndicale qui convient évidemment. Enfin, dans le cas des petits patrons, qui utilisent que quelques ouvriers ou employés, les Compagnies privées fournissent la meilleure solution.

Envisageant les systèmes dits de capitalisation et de répartition, M. Marie estime que le système de la répartition ne peut se concevoir que dans le cas de l'assurance obligatoire à effets immédiats, et que, dans tous les autres cas, le système de la capitalisation s'impose.

Dr. Schaertlin (Switzerland) said that the discussion had been of a discursive character, but that was an advantage. Two great principles had been mentioned—that of liberty, and that of compulsion; and it was of vital importance to decide at the very outset which of these should be adopted. Then, two opposite methods had to be considered—that of accumulation and that of assessment. Under the former, actuarial premiums were charged, and were invested to provide the pensions at maturity. Under the latter, the payments of the year were simply met out of the income of the year. He thought that the method of accumulation was forced upon us as a matter of necessity, and that the method of assessment was contrary to every scientific principle. All those who had hitherto spoken had apparently shared these views, and he would have liked to hear an advocate on the other side.

The President, in closing the debate, said that it was very satisfactory to have had so interesting a discussion. He wished to explain the silence of the British members of the Congress. Government had appointed a Committee of Experts to consider the question of Old Age Pensions, and that Committee, which included several members of the Congress, had not yet reported. The mouths of those best able to speak upon the subject were consequently closed.

CONCLUDING PROCEEDINGS OF THE CONGRESS.

GENERAL BUSINESS.

After concluding the reading and discussion of Papers, the Congress passed to the consideration of General Business.

Third International Actuarial Congress.

On the invitation of the President, M. Léon Marie (France) rose, and, speaking in English, said :—

During the year 1900 a great International Exposition will be held in Paris. I know that the meeting of our Actuarial Congress would take place in ordinary course only in the year 1901, but you will perhaps think that it would be possible to hold it in Paris during the time of the Exposition, because in all branches of human knowledge such meetings will then be concentrated in Paris, and because residence in our City will at that time be more agreeable. I am therefore authorized by the Institute of French Actuaries to request the honour and pleasure of your presence in Paris during the year 1900.

M. A. Bégault (Belgium) seconded the proposal of M. Marie.

Mr. E. McClintock (America) said that the Actuarial Society of America had at its last meeting authorized its delegates to this Congress to invite the next Congress to meet in New York. This action was taken in ignorance of the expectation of their friends in Paris that the Congress should meet a year earlier in order to attend the Paris Exposition. At the same time, the proposition of their French friends had been so obviously agreeable to all concerned, that the American delegates had concluded that it was part of their authorization to postpone the invitation, and to make a suggestion, of course without binding the Congress, and to express the hope that the meeting after the next might be held in New York in 1903.

The President thanked Mr. McClintock and the other American delegates for so courteously postponing their kind invitation, and formally submitted to the Congress the resolution—that the meeting of the Third International Actuarial Congress be held in Paris in 1900.

The resolution was carried with acclamation, and M. Marie returned thanks for the cordiality with which his proposal had been received.

Permanent Committee.—Alteration of Regulations.

The PRESIDENT stated that, in accordance with the notice he had given the previous day, a meeting (which was necessarily informal) of the Executive Council of the Permanent Committee of International Actuarial Congresses had been held that morning, and had considered certain modifications of the Regulations which experience had shown to be desirable. Article 5 gives the Council power to nominate correspondents whose duty it shall be to represent it in countries where it is not represented by any member of the Bureau. This power, in view of the increased work thrown upon the Council, was not found to be sufficient, and the Council unanimously recommended that the additional power be granted them of electing temporary consultative members. He therefore moved to amend Article 5 by inserting after the second clause a new clause as follows :—

It may also co-opt as Temporary Consultative Members, members of the Permanent Committee not already on the Executive Council, to carry through matters remitted to it by International Congresses.

Il pourra également s'adjoindre, à titre temporaire et consultatif, des membres du Comité Permanent ne faisant pas partie du Conseil, pour mener à bien les travaux dont l'exécution lui aura été confiée par les Congrès internationaux.

M. BÉGAULT seconded the motion, which was carried unanimously.

The PRESIDENT explained that under Article 6 the Executive Council could meet only in Brussels, but that that limitation was found to be very inconvenient. For instance, the Members of the Council were at present in London, and it would be a great advantage could they hold a formal meeting, but this the Regulations did not provide for. Similar difficulties would arise at future Congresses, and he therefore moved that the first clause of Article 6 be cancelled, and that in its place the following clause be inserted :—

The Executive Council shall meet as a rule at the Headquarters of the Permanent Committee, and shall be convened by the President, or, failing him, by the General Secretary. The Bureau may, nevertheless, convene a meeting of the Council in any other town, when special circumstances seem to justify such an exceptional course.

Le Conseil de Direction se réunit en principe au siége du Comité Permanent, sur convocation du Président ou, à son défaut, du Secrétaire Général. Le Bureau peut néanmoins convoquer le Conseil dans une autre ville, lorsque des circonstances particulières lui paraîtront justifier cette mesure exceptionnelle.

M. BÉGAULT seconded the motion, which was carried unanimously.

Votes of Thanks.

The PRESIDENT, in proposing a vote of thanks to the Hon. Vice-Presidents, said that most of these gentlemen were statesmen, engrossed in public affairs, and unfortunately the Congress, therefore, had been deprived of their presence. He had, however, been assured by some of them to whom he had had an opportunity of speaking,

that the proceedings of the Congress had attracted considerable attention on their part, and that they had felt great interest in them, more particularly in those subjects which included workmen's compensation and old age pensions. These questions were exercising a very considerable influence upon political and social life in this country at the present time, and he had been particularly desired, by one of the gentlemen to whom he was referring, in view of the proceedings that might occur in Parliament, to send him copies of the whole of the Papers. The Secretaries would have much pleasure in conveying, on behalf of the Congress, their acknowledgment of the courtesy of the Hon. Vice-Presidents in permitting their names to be connected with proceedings.

The vote was carried unanimously.

The President proposed a vote of thanks to the contributors of Papers, and, in doing so with the utmost cordiality, took the opportunity of saying that in amplitude and diversity, both of subject and application, those Papers had demonstrated that the fortunes of the Congress had in no degree diminished since the last international meeting. The Papers had not merely been of importance in themselves, but they possessed the very special advantage of concentrating into one focus information which it would have been very difficult, if not impossible, to obtain elsewhere.

The vote was carried unanimously.

The President, in proposing a vote of thanks to the Vice-Presidents, said that it was a very sincere pleasure to him to propose that the most cordial acknowledgments of the Congress be accorded to the Vice-Presidents for their attention to the work, for their courtesy to the members, and for the very helpful manner in which they had conduced to the satisfactory character of the proceedings.

The vote was carried unanimously.

Mr. W. D. Whiting (America) said he rose with mingled feelings of regret and of gratification to move a vote of thanks to the President and Officers of the Second International Congress of Actuaries—of regret, because such a motion marked the close of a most delightful and instructive association, but of gratification, because such a vote, instead of being perfunctory, was unusually well-deserved. In the management of the meetings, composed of persons of widely divergent views, different countries, races, and religions, no single incident had occurred to mar the harmony, or leave any cause of regret, other than the all too short duration of the Congress. In moving the vote of thanks, he begged leave to mention particularly the name of one who by his many accomplishments and indefatigable labours had contributed not a little to the success of the Congress—Mr. George King.

M. Pokotiloff (Russia) proposed a vote of thanks to the Organizing Committee of the Congress and to the Executive Council of the Permanent Committee of International Actuarial Congresses.

The motions of Messrs. Whiting and Pokotiloff were carried unanimously.

The President, in reply, cordially thanked the members for the welcome sign of appreciation of the labours of the officers of the Congress. For himself he would say nothing, since the unabated kindness of the members had rendered his duties, he would not merely

say of the least onerous character, but of the most pleasant description. For his colleagues, however, the genuine workers in that enterprise, he felt that he could not speak in language too weighty, too impressive, or too eulogistic, of the work which patiently, courteously, and ably, they had sustained. They thoroughly deserved the thanks. When he (the President) ventured to utter some observations at the commencement of the Congress, he expressed the hopes which they then entertained respecting the results of their labours, in the words of Virgil; and now that they had reached the closing scene, at all events of actual work, he felt that he could not convey his sentiments more adequately than by returning to the same poet. But in using Virgil's expressions he was confident that, with the memory of the past still fresh in their minds, they would reject the hesitating "forsan" of the poet, and would all assuredly exclaim:

"*Hæc olim meminisse juvabit.*"

INSTITUTE OF ACTUARIES.

JUBILEE DINNER.

The Jubilee Dinner of the Institute of Actuaries was held at the Holborn Restaurant, on the evening of Friday, 20 May 1898. The Foreign Members of the Congress and the Official Delegates were invited, and 231 gentlemen sat down to table.

Mr. T. E. Young, President of the Institute of Actuaries, and of the Congress, occupied the Chair.

After the usual loyal toasts had been honoured:—

Toast of "The Institute of Actuaries."

The Chairman, in submitting the toast of the evening, the Institute of Actuaries, said:—Gentlemen, it is now my happy privilege to propose the toast of prosperity to the Institute of Actuaries. So universal, I believe, is the friendly feeling entertained towards the Institute, that the simple submission of the toast would form its adequate commendation. I may, however, be permitted to add a few words in just exhibition of its claim to our attachment, although the affluence which the subject places at my disposal somewhat bewilders my capacity of spending. I submit these brief remarks the more gladly because, on the present occasion, we celebrate the completion by the Institute of half a century of useful work.

To the observant student of the significance of general events, the years immediately preceding and succeeding 1848 were of striking import, exhibiting, as they did, a general and manifold movement towards national and social unity, both in England and on the Continent. The political struggles on the Continent for constitutional government; the fiscal policy adopted in England, with the repeal of the Corn and Navigation Laws,—all these concurring events exercised their influence upon the fitness of the times for the formation of a body of the character of the Institute. It is obvious, of course, that there was no direct ostensible or conscious community of specific sympathy between the establishment of the Institute and these widely diffused popular hopes; but no general wave of feeling is ever produced, from whatever source of excitement it may derive its spring, but spreads its pulses, and registers its effects, in countless channels of activity and thought, far removed from the scene and the cause of its actual origination.

Combined with this wide-spread tendency of popular movement, we find a more revelant stimulus, similarly pointing, in the actuarial publications which heralded and followed that memorable year in our story. The publication of the remarkable volumes of David Jones, the first Students' Text-book of our science; the issue of the Tables based upon the experience of the Seventeen Offices; the constructive work of Orchard; and the contributions of other writers; all made evident the fact that the period was mature and propitious for the promotion of an organization which should embody the scattered energies of professional life into the collective force of a permanent and authoritative union. Under those conditions, both general and special, the Institute arose in 1848. Its

original constitution formed an admirable illustration of the sagacity and breadth of view of its founders. The scheme, conceived in the spirit of a genuine law-giver, was capable of continuous and harmonious expansion; freed from the rigid trammels of framework which so frequently mar the development of scientific bodies, it combined the compactness of a professional Institute, with an elasticity of adjustment to the changing circumstances which experience might present. Individual liberty was conserved; the narrow and illiberal limits of a Trade Union were avoided; while the concentrating influence of corporate life was maintained. And in its subsequent expansion and reform, the Institute observed the truth of experience, whether individual or collective, that the word "progress" is, not infrequently, but another expression for a wise delay. The ample extent and manifold diversity of its investigations, and their consummate application to practical problems, find their authentic evidence in the 34 volumes of its published Transactions. These contributions have not merely provided a mass of statistical data for varied deductions, but have also added precision to the methods and principles of our science. They have, moreover, conferred upon the practical administration of Life Assurance bodies, and of other societies dependent upon the doctrine of averages, a uniformity of technical system, which has been productive of the widest benefit to the community. Beyond even this conspicuous service to public utility, the researches of the Institute have opportunely assisted commercial life by impressing a reasonably exact market value upon pecuniary interests, in consequence of the practical application of our doctrines, which, in prior times possessed but a purely speculative and conjectural character.

Detailed commendation, I think, would be merely idle and superfluous, in view of the imposing nature of the subject itself, in reminding you of the memorable enquiries into mortality which occurred a generation ago, and of the exhaustive and truly scientific investigation which at present is proceeding. Expanding again, gentlemen, beyond this range of service, spacious though it be, the Institute, as a corporation of expert citizens, has, on many occasions, rendered substantial assistance to the State in the public interest, which the State has acknowledged, by aiding in devising the appropriate form of investigation and treatment of social and economic problems of permanent import. The Institute, again, has strenuously endeavoured to supply to the profession a universal analytic language, which should combine our varied work into a scheme of symmetric, consistent, and expressive speech understood by all.

I very eagerly take the opportunity of dwelling, with pardonable pride, upon the fact that from the date of its inception, to the present day, the Institute has spontaneously, and in a spirit of genuine trusteeship to the profession at large, recognized its paramount responsibility in promoting an enlightened code of education for its students—under a true conception of educative purpose—for the purport and aim of that scheme through the machinery of classes of instruction, lectures on finance and law by practical teachers, admirable text-books, and the emulative stimulus of prizes, have ever assumed the essential form of education,—not the mere accumulation of inherited knowledge, not the simple production of technical experts, but continually and consistently the educing of faculty in a judicious mode and direction, where soundness of judgment and sagacity of adaptation, combined with practical acquaintance with the springs and movements of commercial affairs, have been assigned their rightful functions as the supreme controllers of the technical instruments which professional skill and knowledge provide.

And I linger for a moment, with your permission, to allude to another distinctive feature of the Institute which allies it with the nature of all progressive bodies. In a work by a famous female writer, and in a passage which the historian Hallam deemed to be worthy of the keen insight of Tacitus, she aptly explained the failure of Rienzi, the last of the Roman Tribunes, and the other reformers in Italy, by suggesting that, unhappily, and without any personal

embodiment, they accepted ancient remembrances for future hopes. The Institute has never been misled by this incapacitating error. It has never forgotten the truth that noble traditions alone constitute but a precarious basis and tenure of power, and that sustained usefulness and influence are only possible when the recollections of a famous past are transmuted in capacious minds into virile efforts to realize and expand a repetition of those traditions in wider and more serviceable future forms.

In submitting this toast, and concluding this rapid outline of the history and work of the Institute, I justly associate with it the name of my friend Mr. Manly. His long and able labours in the service of the profession, his earnest interest in the concerns of our *Alma Mater*, form, I think, a portion of those significant events which "cast their shadows before", as distinctly indicating him as its fitting chief. And in view, gentlemen, of those prophetic signs being ratified by popular vote, I beg leave to convey to him in your name and mine our cordial wishes that his tenure of office may be no less profitable to our body than personally happy to himself.

The toast was received with enthusiasm.

Mr. Manly, in responding to the toast, said—Mr. President and Gentlemen, I thank you from the bottom of my heart for such a demonstration, and I trust Mr. President that my future actions may justify your very kind expressions and wishes.

Referring now to the toast, this is a very memorable occasion for the Institute of Actuaries. With all its kind and generous friends around it, it is now celebrating its Jubilee. At the end of these 50 years, I think the members of the Institute may look back, and survey that time with a sense of veneration of and gratitude for the past, a conscientious feeling of pride in the position which it now holds, and look forward with confident hope to its future prosperity and usefulness. You, Mr. President, have referred to the 34 volumes of the Transactions, in which are recorded the productions of those earnest men who founded the Institute, nurtured it in its childhood, reared it to manhood, and of whom some have seen it grow to its full stature. The mention of these volmues calls to my mind some of the names—the names of those who have departed from us, but who are held in the highest respect and veneration amongst us still. There were John Finlaison, Charles Jellicoe, Peter Hardy, Samuel Brown, Hodge, Tucker, John Higham, Orchard, Peter Gray, Gompertz, Woolhouse, Makeham, Lazarus, and Sheppard Homans, who were instrumental in forming very much the character of our science. The mention of the last name seems to cast a shadow over our proceedings, for Mr. Sheppard Homans had intended to be amongst us on this occasion, but Death snatched him away suddenly just before these meetings in which he had hoped to take part. His keen intellect, untiring zeal, amiable character, and social qualities, endeared him to all who knew him. Then there are other names that we recall,—names of men whom we are pleased to have amongst us still, and some of whom are present to-night. Some of them have already passed into retirement, and are enjoying that rest which they have so well earned after their active life. These names are household words in the profession: Bailey, Day, Sprague, Meikle, and Hendriks. But I won't venture further, for it is difficult to draw the line. The names of those who are still doing a great work for the Institute are so numerous that I won't mention any. All I would say, gentlemen, is, if you want to know them, "circumspice."

Then I should like to refer to the great work which the Institute undertook, and to which the sponsors, at its birth, promised that it should devote itself, namely, the work of extending and improving the data upon which our calulations are based. In 1863, the Council determined that they would provide an improved Table representing the mortality amongst assured lives. With great labour, they collected together the experience of 20 British Offices, and the Table of experience was based upon particulars given on 186,000 cards. Up to that time it was undoubtedly the greatest work ever undertaken, and the Table based on it

became the standard Table of mortality of assured lives throughout the world. But the Institute knows no finality, and it has recently undertaken a far grander piece of work. Seeing that there is every reason to believe that during recent years the rate of mortality has become considerably lighter—we cannot say exactly in what direction, but there is no doubt that there has been an improvement—for the improvement in surgical science, the improvement in sanitary science, and the improvement, I think, in the habits of the people also, have all helped to make life longer and pleasanter—it is desirable, I may say absolutely necessary, that we experts should find out that latest ratio of mortality, according to age, which is the foundation upon which we base all our calculations. We are now collecting the experience of 60 offices during the last 30 years, so as to exclude the former period of what may be called insanitary conditions. That experience is recorded on 1,070,000 cards which contain the particulars of policies on assured lives, and about 34,000 cards which represent annuities purchased. That, gentlemen, should certainly give us an experience upon which we may safely base our future calculations. I will not venture to say that the Institute of Actuaries will not undertake further investigations in the future, for there is no reason why the improvement in mortality should not continue; but we shall certainly have a new experience which will last at least a generation.

Then, Sir, you have referred to another duty that the Institute has undertaken, and that is to educate its members. For that purpose, it established examinations, and later established also classes for tuition. I am going to recall some of the circumstances of years ago. I go back to the time when I passed my examinations. At that time it was thought phenomenal if a dozen candidates appeared for the first examination, six for the second, and three for the third—making 21 in all. Recently we have had pressure brought upon us, to which we have gladly submitted, to extend these examinations to the Colonies; and our Colonial brothers have availed themselves of this advantage very largely. This year, instead of a total of 21 for the examinations, we have 170 presenting themselves in London, and 60 in the Colonies. Our educational system, I think, has been a very great success. Not only have we established classes, but we have induced men of high intellect and character to write our text-books, one of which has been translated into French by a gentleman present to-night, who has done his work in a most admirable manner. That is becoming, or has become, one of the standard works on actuarial science throughout the Continent. We have at our Congress agreed to adopt an Universal system of notation, so that, no matter what our individual language may be, actuaries may be able to communicate with each other in symbols which we shall all understand, and there is the possibility arising out of this, that in some future years we may be extending our examinations to the Continent and to the United States. Thus, I think, we may look forward with hope to the future.

During our last session we had some very valuable papers presented to the Institute by the yonnger members of our profession, who have ably taken up the problem which has in recent years been exercising the minds of many of their elders—a problem which I think has now been solved, to the satisfaction of all; the problem of the valuation of endowment assurances in groups. We have also had a very interesting and able paper presented to us upon a subject which certainly has assumed enormous proportions in England, and no doubt elsewhere—the subject of industrial assurance. We have had a paper presented also by one of the younger members; a paper which contains a great deal of original thought on the relation of the actuarial profession to the State. When we find the younger members carrying aloft the banner in this manner, and bearing forward the torch of knowledge which has been handed down to us and is passing on to them, we may feel confident that the future of the Institute is assured.

Toast of "International Actuarial Congresses."

Mr. George King, in giving the toast of International Actuarial Congresses said,—Mr. President and Gentlemen, at such a banquet as this, there is frequently

a friendly rivalry as to which is the toast of the evening. You, Sir, have just given a toast which, in this gathering, may perhaps properly claim that honour. Nevertheless, I submit that the toast which has been placed in my hands is one deserving of equal consideration, because International Congresses of Actuaries are worthy of our highest appreciation. They have many uses, but I think the first that we should name is that they foster friendship amongst actuaries of all countries. I have never experienced anything more delightful than the friendships formed two years ago at Brussels, and renewed this year in London; and which I hope will be still further strengthened in Congresses to come. This Congress has enabled us to form additional friendships, which I feel sure will also be enduring, because a common profession and common interest draw us to each other.

Then another use of International Congresses is that they enlarge our views. Living by ourselves we become narrow-minded; but when we meet our friends from many countries, and when we find how the same subject can be looked at from many sides, our views are enlarged, and our usefulness is extended.

But, after all, actuaries are really many-sided. I have seen in some of the daily papers, in which comments have been made on our Congress, remarks that we are men of figures; and it is said we are confined to figures and technicalities. We are not ashamed of figures and technicalities, but they are only our tools, and we have far wider aims. The subjects of the papers we have had before us show that fact. It is true that we have had papers on technical subjects. We have had papers on graduation; papers on the limits of risk; papers on notation:—but there have been far more papers, and far more important papers let me say, on general subjects. We have had papers on legislation, and some people may think it is strange that actuaries should meddle with legislation; and yet, gentlemen, it is necessary. Legislatures cannot frame wise and useful laws for insurance companies, for friendly societies and kindred organizations, without the help of the Actuaries.

Then we have had papers on friendly societies—friendly societies in different countries—and that shows that we do not confine our attention, as many people think, merely to life assurance; but we are called upon to deal with subjects which perhaps far more closely affect the masses. It is very interesting to see how in the various countries the friendly societies are passing through the same stages; through the stage of infancy, when the subject is little understood; through the stage of struggle, when they try to put right the mistakes made in the beginning; and, I hope, to the stage of success, when they may work with endless good to the community.

Then we have had papers on what is practically a new subject, which is steadily extending throughout the world—papers on Workmen's Compensation. In this country we have had recent legislation on the subject; there has also been legislation in various countries on the Continent, and legislation is pending in other places; and a great deal can be done by Actuaries to make legislation on such a subject really a success, because, unless the legislation is based on scientific principles, it must fail.

Then we have had papers on the subject of Old Age Pensions, and we see how that is being discussed all over the world, and how many countries are seeking to find a solution of this most difficult problem.

All these matters, gentlemen, come before the actuaries, and it is to the actuaries that Governments must look for help in working out these very difficult questions. This leads me to point out that we actuaries are here to assist the Governments, and we all feel, I am sure, that the aims of the Governments and our aims are the same—we all seek the good of the people. We cannot expect Cabinet Ministers, with their multifarious duties, to understand all the details of complicated actuarial questions. We cannot even expect Government officers, who have not had the special training requisite to grasp the difficult problems, to understand the subject. We may even say we can hardly expect a Goverment actuary, brought up solely in one department, and without wide experience, to fully grasp all that is required to make successful legislation. It is to the actuaries

in touch with the active life throughout the world that Governments must look to for help in the matter.

Some Governments, I am afraid, in the past have been too apt to think that life assurance societies and actuaries require careful looking after. Their action reminds me of a little picture that the late Du Maurier had in *Punch*, which illustrated the big sister telling her little sister to go and see what the baby was doing and to tell him he mustn't. That is something like what the action of some Governments has been towards life assurance companies and actuaries. Well, I think that actuarial Congresses, such as we have had here, will do a great deal to sweep away the mists, and to cause Governments to see that we really are seeking to co-operate for the good of the people; and that it is to us that they must look for assistance. They are not our enemies and we are not theirs, because both they and we seek the public good. We can co-operate, and the co-operation of the Governments and the actuaries in carrying through suitable legislation on these most important subjects will bring about good to the public.

I am very pleased to think that the Congress we have had in London, shows that these results are being achieved. We have only to look at the list of our Honorary Vice-Presidents to see the great interest that the Governments of all countries are taking in this Congress. I trust that, as time goes on, they will come into closer touch with us. I may say that the Organizing Committee have had at least two letters from important Government Departments on the Continent, on the subject of the Congress, with requests that copies of the volume we shall publish containing all the papers may be sent to them in view of legislation. I do not think anything could be said which would show more fully the uses of an International Congress of Actuaries.

Sir, International Congresses will strengthen the actuaries. Taken singly we can do nothing. Even our individual societies in different centres can do very little. But a Congress which brings together all the societies, and thus brings into the closest union all the actuaries, is a mighty power. But I may here remind you that we have not only Congresses of actuaries to unite us. Having a Congress every few years would be very useful, but it would not be enough. We have established a Permanent Committee, to which the actuaries of all countries may belong; and at all times that Committee is available as a union of actuaries, to act in concert, and to act in strength. Here, Sir, I would put in a plea for this Permanent Committee. It is a very large Committee, with a strong Executive Council, and it includes many foreign members; but it should be very much larger, and the number of English actuaries who belong to it is so small that I would be ashamed to mention it. I therefore beg English actuaries here to join this Committee. It is due to our foreign friends that we should do so, because they are good enough to say that our joining the Committee would vastly add to its strength.

Then I think I may say there is one other good which in a small way we can do in the world by International Congresses. In these days of wars and rumours of wars, *we* know no hostile frontiers, *we* know no national jealousies; but we work together in fraternal unity. It is not much; but every little helps, and in time I hope that, aided by such Congresses, the jealousies amongst nations, and wars and rumours of wars, will cease.

I may for one moment allude to our late lamented friend, M. Mahillon. He was the President of the First Congress, and we all came to feel what a great man he was, and what great power he had; and it was very much due to him that the First Congress, and I also add this Congress, was so successful. Moreover, I cannot refrain from mentioning M. Le Jeune, of Antwerp, who did so much for the First Congress, and who could not come here, but who has contributed a most valuable paper to our Transactions; and also my friend, M. Bégault, the Secretary of the First Congress.

Mr. President, I am asked to couple with this toast two names. One is that of M. Lepreux, of Belgium, President of our Permanent Committee. We

know, Sir, that Belgium is geographically a small country; but, nevertheless, I venture to say that it is a great country, because in many ways it has shown us an admirable example. I think that thrift in Belgium has reached a greater development than in any other part of the world; and there they are now trying to put thrift on a thoroughly scientific basis, and to make it permanent and not ephemeral. It is through such men as M. Lepreux that this is being done. The other name is that of M. de Savitch, of Russia, in whose country, which extends over two Continents, there is a great field for the advancement of our science, and for its practical application. I give the toast of International Actuarial Congresses, coupled with the names of M. Lepreux and M. de Savitch.

M. Lepreux, in responding to the toast, said:—

Mr. President and Gentlemen,—It is not without deep emotion that I rise to respond to the toast given by my good friend, Mr. George King. He who would have been in my place if death had not so ruthlessly taken him soon after the first International Actuarial Congress, was one of those rare men whose memory remains in the soul and in the heart of those who have known them. It is he who, carrying much greater weight than I, should have presided over the Permanent Committee, the inauguration of which was the crowning work of the Brussels Congress. In his inaugural address, the worthy President of the Second Congress, Mr. Thomas Emley Young, and, a moment ago, Mr. King, paid due tribute of honour to him whose energetic initiative created the work of International Actuarial Congresses, and I thank Mr. Young and Mr. King in my own name, and in the names of my colleagues of the Association of Belgian Actuaries, of whom some, like myself, were friends and disciples of Mahillon.

Few among you, gentlemen, know how the idea had its birth in the mind of my predecessor, of convening in Brussels an International Congress of Actuaries. There was under discussion in the Belgian Parliament in 1894 the Bill relating to Friendly Societies, submitted by Mr. de Smet de Naeyer, Finance Minister, and at the present day Honorary President of the Society of Belgian Actuaries. One of the clauses of this Bill proposed to reform the Permanent Commission on Friendly Societies, into which the minister wished to introduce two actuaries.

"Actuaries," asked one of the members of the House, "what are we to understand by this word, which is not

Monsieur le Président, Messieurs,—Ce n'est pas sans éprouver une vive émotion que je me lève pour répondre au toast de mon excellent ami, M. George King. Celui qui l'eût fait à ma place, si la mort ne l'eût brusquement frappé peu de temps après le premier Congrès international d'actuaires, Léon Mahillon, était un de ces hommes d'élite dont le souvenir reste dans l'esprit et dans le cœur de ceux qui les ont connus; c'est lui qui, avec bien plus d'autorité que moi, eût présidé le Comité Permanent dont l'institution fut le couronnement du Congrès de Bruxelles. Dans sa harangue inaugurale, l'honorable Président du second Congrès, Mr. Thomas Emley Young, et tout à l'heure Mr. King, ont payé un juste tribut d'hommages à celui dont l'initiative hardie créa l'œuvre des Congrès internationaux d'actuaires; en mon nom, au nom de mes collègues de l'Association des actuaires belges, dont quelques-uns furent, comme moi, des amis et des disciples de Mahillon, je remercie Mr. Young et Mr. King.

Peu d'entre vous, Messieurs, savent comment prit naissance, dans l'esprit de mon prédécesseur, l'idée de réunir à Bruxelles un Congrès international d'actuaires. On discutait, en 1894, au sein du Parlement belge, le projet de loi concernant les sociétés mutualistes présenté par Mr. de Smet de Naeyer, Ministre des Finances, aujourd'hui President d'honneur de l'Association des actuaires belges. Un des articles de ce projet proposait la transformation de la Commission permanente des sociétés mutualistes, dans laquelle le Ministre voulait introduire deux actuaires.

"Des actuaires," demanda un des membres de la Chambre, "que faut-il

to be found in the dictionary?" To this sally by one of the most witty of the Deputies, Mahillon determined to reply, not by a definition, but, allow me to say so, by an illustration. It is thus that he formed the resolution to endeavour to bring together the most illustrious representatives of actuarial science in a country where that science had scarcely yet been born. He came to London, as he went to Paris, and succeeded in interesting in his scheme the English and the French Actuaries; and shortly thereafter he presided in Brussels over the First International Actuarial Congress, surrounded by learned men, assembled from all countries, in order to solemnly affirm the existence of the high social bearing of the code of scientific doctrines which England has brought to such perfection. The work of International Actuarial Congresses had been inaugurated.

It has been said, not without truth, that all Congresses are not useful. It has even been asserted that some have been mischievous. Such allegations cannot be urged against Actuarial Congresses, which are, on the contrary, among those which rulers, at the present time, watch with close attention, and from which they seek instruction.

Who can doubt that the majority of European States look upon the development of the spirit of thrift as a certain means of improving existing social conditions? But it is beginning to be understood everywhere that in the domain of thrift it is difficult, if not dangerous, to venture without the assistance of the actuary, and that we have no right to inaugurate ill-considered schemes which may prepare for generations yet to come bitter disappointments.

The London Congress has come at an opportune time, at the moment when, while experiments of the greatest interest are being tried in some countries, other countries are on the point of laying the foundations of great social fabrics. We may hope that the study which the Congress has given to the important questions entered on its agenda, will exert on the resolves of the Governments an influence which may be decisive.

entendre par ce mot qui ne figure pas dans le dictionnaire?" A cette boutade d'un de nos plus spirituels députés, Mahillon voulut répondre, non par une définition, mais, permettez-moi de le dire, par une exhibition. C'est ainsi qu'il prit la résolution de chercher à rassembler les représentants les plus illustres de la science actuarielle dans un pays où cette science venait à peine de naître. Il vint à Londres, comme il alla à Paris, et parvint à intéresser à son projet les actuaires anglais et français; peu de temps après, il présidait à Bruxelles le premier Congrès international d'actuaires, entouré de savants venus de tous les pays pour affirmer solennellement l'existence et la haute portée sociale d'un corps de doctrines scientifiques que l'Angleterre a portées à un si grand degré de perfection. L'œuvre des Congrès internationaux d'actuaires était fondée.

On a dit parfois, non sans raison, que tous les Congrès ne sont pas utiles; on a même prétendu qu'il y en avait de nuisibles. De pareils reproches ne peuvent être adressés aux Congrès d'actuaires, qui sont, au contraire, au nombre de ceux que les gouvernants, à l'heure actuelle, observent avec attention et dont ils attendent des enseignements.

Qui pourrait douter que la plupart des Etats européens considèrent le développement de l'esprit de prévoyance comme un sûr moyen d'améliorer le régime social existant? Mais on commence à comprendre partout que, dans le domaine de la prévoyance, il est malaisé, sinon dangereux, de s'aventurer sans l'aide de l'actuaire, et que l'on n'a pas le droit d'échafauder hâtivement des combinaisons qui prépareraient pour les générations à venir les plus amères déceptions.

Le Congrès de Londres est venu bien à son heure, au moment où, pendant que des expériences du plus haut intérêt se poursuivent dans certains pays, d'autres sont sur le point de jeter les bases d'organismes sociaux considérables. Il est permis de croire que l'examen que le Congrès a fait des importantes questions inscrites au programme de ses travaux exercera sur les décisions des gouvernants une influence peut-être décisive.

In closing, gentlemen, permit me, as the President of the Permanent Committee, to remind you that we cannot fulfil the delicate mission of giving advice, perhaps even warning, to those who guide public affairs, except by the union of the forces of the national Institutes. I therefore appeal to all of you for support for active co-operation; and I am sure that you will listen to me, because in charging your glasses with me, in drinking to the success of the work of International Actuarial Congresses, you cannot help remembering the Permanent Committee, which must be, and which is, the perpetual evidence of their existence and of their vitality.

En terminant ce toast, permettez, Messieurs, au Président du Comité Permanent de vous rappeler que cette mission délicate de donner des conseils, des avertissements même à ceux qui dirigent les choses publiques, nous ne pouvons avoir la prétention de la bien remplir que par l'union des forces individuelles des instituts nationaux. Je fais donc appel à votre concours à tous, à votre active coopération et je suis sûr d'être entendu parce que, en levant avec moi votre verre, en buvant à la prospérité de l'œuvre des Congrès internationaux d'actuaires, vous ne pouvez vous empêcher de songer au Comité permanent qui doit être et qui est l'affirmation constante de leur existence et de leur vitalité !

M. De Savitch speaking in English, said—Mr. President and gentlemen: If I dare now raise my voice in this gathering of eminent men, after the eloquent speeches which we have heard, it is because I am impelled to do so by a feeling which is so poetically expressed in a sentence very well known and very popular in my own country—" When the heart is full, the tongue cannot but speak." Gentlemen, the value of the splendid scientific work done by the Institute of Actuaries during the fifty years of its existence was appreciated two days ago by one of the most celebrated and learned men of the whole world, Lord Kelvin. The position which actuarial science holds in England proves better than anything else, the practical usefulness of the Institute's intellectual activity.

I should like to call attention to another point of view. Human nature cannot satisfy itself with the interest of intellect only; it seeks always food for the feelings of the heart. Abstract ideas become much more strong, and receive much more vital force, when connected with the feeling of personal esteem; of personal friendship and sympathy. And I can state that during this Congress the members have not only admired the Institute of Actuaries, but have learned to esteem and love its eminent President and its members. This effect is produced not only by the scientific merits of these gentlemen; not only by their large hospitality; but more by the kindness, heartiness, friendship and cordiality with which they have received us here in London, in this capital of the world. Going home we shall take with us—and I am sure that all the foreign members of this Second International Congress will agree with me—increased respect for the public activity of the Institute of Actuaries; and in our own hearts we shall cherish the best sentiments towards our President and the English members, and I can add without hesitation towards the nation itself, whose representatives they are.

Letters of Regret.

Mr. Burridge said—I have to communicate letters of regret from many eminent gentlemen unable to be present. His Excellency the American Ambassador, the Hon. John Hay, who attended our conversazione last night, now writes that a previous engagement prevents him from dining with us. The Congress has been delighted to have had the advantage on two occasions this week of the presence of that eminent man of science, Lord Kelvin. He did us the honour of dining with us on Wednesday, but an engagement prevents his attendance to-night. The Right Hon. Sir Michael Hicks-Beach, Chancellor of the Exchequer, one of our Honorary Vice-Presidents, regrets that a previous engagement prevents his attendance to-night. The Right Hon. J. Chamberlain,

who is so interested in old age pensions, writes us that an engagement makes it impossible for him to attend. The Right Hon. C. T. Ritchie, President of the Board of Trade, states that his parliamentary duties detain him. The Right Hon. the Lord Mayor, who did us the honour of giving us a reception at the Mansion House, cannot come. Another of our Honorary Vice-Presidents, Sir John Lubbock, cannot come, as he has a prior engagement. Then we had hoped to have seen with us the Minister of the Colonies of France, and the Minister of Commerce of France; and we had greatly hoped to have had Dr. Karup of the Gotha Life Assurance, who would have been with us, but he is detained on the Continent. Mr. A. Fontaine, representing the Minister of Commerce of France, is also absent, and Mr. L. Fontaine representing the Director-General de la Caisse des Dépots et Consignations. The Minister of Finance of Belgium cannot be with us and expresses his regret; and the Minister of Finance of Holland is also detained. Mr. Hermann Laurent, Vice-President of the French Institute of Actuaries, would have liked to dine with us. Dr. Walther, of Leipzig, Dr. Samwer, of Gotha, M. Henri Adan, of Brussels, and Mr. Gerkrath, of Berlin, all send their acknowledgments to this assembly, and express regret. And, lastly, Sir, I would remind you of the absence of a distinguished member of the Institute of Actuaries, owing to a domestic bereavement, our esteemed friend and past President, Mr. Finlaison.

Toast of "The Guests."

Mr. D. Deuchar, President of the Faculty of Actuaries in Scotland, in proposing the toast of "The Guests," said—Mr. President, I feel it to be a very high honour to be entrusted with the duty of proposing so important a toast at this great gathering. We have with us, as our guests to-night, many gentlemen of great eminence, most of them actuaries, but some of them eminent in other walks of life. Prominent in this latter class is the Right Honourable Leonard Courtney, a distinguished Member of Parliament, who, as a former Chairman of Committees in the House of Commons, and in many other important capacities, has rendered valuable service to our country; and who has a certain connection with the business of life assurance, in that he is a director of the large and successful company whose Life Department is so ably administered by you. I may also mention the name of another gentleman, not an actuary, but indirectly connected with the actuarial profession, whom we have with us this evening. I refer to Mr. Price-Williams, who is, I understand, a descendant of the renowned Dr. Price, one of the pioneer actuaries of the United Kingdom. Among the Foreign and Colonial actuaries who are our guests to-night, we have representatives from Belgium, Denmark, France, Germany, Holland, Italy, Russia, Sweden, United States, and Canada, and one gentleman representing Japan. We have some Scotch actuaries with us to-night, but as for the most part they are Members of the Institute of Actuaries as well as of the Faculty of Actuaries, they do not come within the scope of the present toast, with the exception, I think, of Mr. Low, the able author of the article on Life Assurance in the *Encyclopædia Britannica*.

We owe a debt of gratitude to many of these gentlemen, who have come from distant countries to attend the International Congress of Actuaries. We owe them also, I think, an expression of regret, if not of apology, for the wet and gloomy weather of the last few days, which must have interfered with their comfort. In regard to the weather, I am afraid that some of our foreign guests who may have been contemplating a visit to Scotland, may feel disposed to abandon the idea, under the impression that if the weather is so bad in London it is certain to be worse in Scotland. There is a story of a Frenchman, who may have been an actuary—but on this point history is silent—who, after enduring for some time the fogs of London, took a journey northward, penetrating as far as Scotland. There he experienced rain, rain, and nothing but rain, although the natives called it mist. Meeting a compatriot who had for some time resided in

the country he said to him, "Monsieur est ce qu'il pleut toujours en Ecosse?" (Does it rain always in Scotland?) To which his friend replied, "Mais certainement non, il neige quelque fois." (Certainly not, it snows sometimes). Sir, I desire to assure our foreign friends that this story is a calumny on Scotland, where at this moment the weather is charming. I therefore hope that no member of the Congress will be deterred, by fears of bad weather, from taking the opportunity of visiting Scotland on this occasion; and I hope personally to welcome some of our guests there in the course of the next week or two. My friend, Mr. King, has alluded very fully to the advantages of such Congresses from a scientific point of view, and has also touched upon their advantages from a social point of view. If I might add a single observation as to the social aspect and beneficial results of these friendly gatherings, I would say that, while not destructive of true patriotism, they tend to sweep away all race prejudices, and all unworthy thoughts in regard to those of other nationalities which we are apt to entertain when we do not know the men. Such Congresses and such social gatherings as the present must tend to bring nearer the happy time which our Scottish poet Burns foreshadowed, when he wrote:

> For a' that and a' that—
> It's coming yet for a' that,
> When man to man the world o'er
> Shall brithers be for a' that.

In concluding, Mr. Deuchar coupled with the toast the names of the Right Hon. Leonard H. Courtney, M.P., Dr. Grosse, Germany, and Dr. S. R. J. Van Scheviehaven, Holland.

The Right Hon. Leonard H. Courtney, M.P., in responding to the toast of The Guests, said: Mr. Young and Gentlemen, I account it a singular felicity that I should be admitted amongst your guests to-night, and that I should be called upon to reply to this toast. But I should have been equally happy, if not equally honoured, if I could have attended as a silent guest to receive your hospitality. I know not to what lucky chance to attribute this honour. Mr. Deuchar has connected my name with that great Institution of which your President is so honoured a servant, and I think it may be in some degree owing to the friendship of Mr. Young that I am present this evening; I should also like to think that it may be in some measure—although I fear this is a mere fancy of the imagination—due to the fact that when I first came to London, now too many years ago, I early associated myself with that fraternal Institution, so many of whose members were members of your own society, I mean the Statistical Society. As Mr. Manly just now read over the names of some of the founders of this Institute, I recollect those who were associated with that other body. The names of Jellicoe, of Samuel Brown, of Hodge, and of Babbage, and one who is still among you, although I fear he is not here to-night—Frederick Hendriks. These are names that I recall from those distant years, and I used to feel, in being associated with them, what I think is the impression that every outsider ought to feel when brought into contact with such men, that here you are in touch with the world of facts; with those whose primary duty it is to measure and value its forces.

Gentlemen, I know not whether you will assent to the criterion which I have often put to myself, but I think it may be accepted after reflection as in a large measure true, that the real test of an educated man is the way he has learned to value the respective worth of things. There are many clever people who are quick to apprehend an argument, but yet slow to learn what the argument is worth. There are many people who are apt to accumulate facts, but who do not seem exactly to understand what is the value of the facts that they have stored in their memory as compared with other facts. Give me the man who has a sense of the relative value of things, and I look upon him as a brother, if not as a superior, in whose friendship I am honoured to enter.

Gentlemen, I have learned for the first time this evening that your Institute was born in the year of revolutions. But many great things arose at that time and

those who are old enough to look back upon it and remember the emotions with which as schoolboys we read of them, may be glad to think how, after many fluctuations of fortune, and after many vicissitudes of chance affecting their early years, they have emerged strong, and grown into a splendid manhood. I would not flatter you. You are a comparatively minor element in the movements of nations; but it is good to know that you too have risen in the course of these fifty years, and are now associated with kindred institutions on the Continent and in America. You are laying the foundations of a science. Nay, more, you have raised it above the primary and secondary stages, which will have great influence on the fortunes of the world.

I have not had the good fortune to be able to attend your sittings. I had desired much to be present at some, if not at all, of them, but I have followed the reports, stinted as they are, which have appeared in the *Times* day by day, and I have been struck with the subjects which you have taken up, and the manner in which you have treated them. Mr. King has said that the Legislatures have manifested towards Life Assurance something of the temper of the elder sister in Du Maurier's sketch, who wanted her younger sister to go and see what the baby was doing, and tell him not to do it. I really do not think that is a just observation with respect to the Parliament of this nation. No doubt, upon the action of Life Assurance those limitations of freedom apply, which apply to all associations which are very numerous here. The common law of England does not admit, or admits only locally under conditions, the principle of limited liability; and through Royal favour, Court grace, or political patronage, charters, in old days, had to be obtained. But apart from that fundamental condition which applied to every range of commercial and financial activity there was never any limitation put upon the working of Assurance Companies, and Parliament has slowly followed after what has been demanded, rather than gone before in laying down regulations of its own. I should have been glad to have assisted at your Tuesday's conference, when you examined the laws of assurance in many nations. I think we should find, if we looked to other countries in the past or present, that a more exemplary degree of freedom has been accorded here than is usually to be found elsewhere.

I should have been glad also if I could have been present to-day. Mr. King referred to the task which was considered at your morning's sitting. No doubt the idea of old age pensions and the principle of compulsory assurance have made great way, and will probably still make great way, in the development of legislation in Europe. But there are difficulties which you would be the foremost to understand in the way of realizing these ideas. Yet here in the midst of your comfort and luxury you cannot help but feel some sympathy with those members of the proletariat, and with those who are a rank above them in the social scale; who contemplate the dreary round of ill-paid toil; of age coming with limited powers; with no resources, and with years of want coming as the necessary sequel of manhood and fully-occupied industry. If we can in any way alter the dismal features of the picture, the Legislature will be most proud to accomplish the task. It cannot do it without your assistance. Whether it is possible or not I am very slow to say, because we have to reconcile what appear to be two inconsistent principles. We want to maintain the strength, and if possible to develope the strength, of individual character; and unless the penalty of want follows upon the sin of improvidence, you lose one of the best incentives to thrift. To rescue old age from penury without impairing, nay, through the strengthening of, individual character, is the end to which we are working, from which we are at present a long way off; but, he who helps us forward to it will always have the sympathy of every well-wisher of his countrymen; nay, the world at large desires that we may move successfully.

Mr. President, there is yet one other thing to which I would like to refer, if I am not detaining you at this late hour. I observe with extreme pleasure that in one of your meetings you made a great step towards what I may call the

accomplishment of a common alphabet for you actuaries of the world. It has been already expressed by more than one, that work such as yours leaps over the confines of States and defaces the jealousies of nations. I am sure that meeting together as you have done here, and laying down a language which you all understand, through which you can work out your problems, so that you can pass from country to country without the least hindrance to intellectual development, you are doing much to remove those international jealousies, those petty strifes, which are the disgrace of our modern civilization, which shame us after a lapse of two thousand years of Christianity. Mr. Young, we think ourselves well advanced in the world. Truly those who went before us were not as we are; but I sometimes reflect with some shame that rather more than a century ago, when war was about to break out and did break out, as too often happened in those days, between the country of France and ourselves, the admirable, the very illustrious Turgot—being at the head of affairs in France—gave orders to all the captains of his country's fleet, wherever they were, that there was one man prosecuting scientific enquiries in distant seas, Captain Cook, who was not to be arrested in his course, and who was to be looked upon as a pioneer of knowledge free from the interference of armed forces. That is an illustration of the debt that was paid to science a century ago. Let it be your aim, you the members of this international meeting here, to reproduce this result, so that we shall not be inferior to those who have gone before us, and so that the scientific purposes of your Society may not only be good for the immediate objects you have in view, but may be good also in establishing a community which is above that of political differences—a community of mankind which shall re-echo the sentiments which attended your advent into the world some 50 years since.

Dr. Grosse responded as follows :—

Mr. President, Gentlemen, the honour now devolves upon me to respond, on behalf of the foreign guests, to the toast which you have just so heartily and kindly drunk in our honour.

In fulfilling this pleasing duty, I should consider it only courteous to reply in the language of this country, if I were sufficiently practised in its use. But under existing circumstances, I must ask your permission to make use of my Mother tongue.

We are moved by varied feelings of a delightful and elevating nature in taking part in this banquet.

In the Institute of Actuaries we *honour* an organization of our professional brethren, which, whether having regard to its age, to the status of its members, to the valuable work it has already accomplished, or to its authoritative position among all similar institutions, holds the highest position. We remember all those renowned men who have assisted by their labours to raise the calling of the Actuary to its true value, most of whom sprang from this Institute, and some of whom we have the pleasure to see in our midst to-day. It is almost impossible to

Herr Praesident! Meine Herren! Es ist mir die ehrenvolle Aufgabe zu teil geworden, namens der ausländischen Gäste auf den herzlichen Toast zu antworten, der uns soeben dargebracht worden ist.

Ich würde es als die Erfüllung einer Pflicht der Höflichkeit betrachten, die Antwort in der Sprache dieses Landes zu erteilen, wenn ich im Gebrauche derselben ausreichende Uebung besässe; wie die Dinge liegen, muss ich mich schon meiner Muttersprache bedienen.

Die allerverschiedensten Gefühle freudiger und erhebender Art bewegen uns bei der Teilnahme an diesem Festmale.

Wir *verehren* in dem Institute of Actuaries diejenige Organisation unserer Berufsgenossen, welche in Bezug auf das Alter, auf den Rang ihrer Mitglieder, auf die bisherigen Leistungen und auf ihre autoritative Stellung unter allen gleichartigen Institutionen den ersten Rang einnimmt. Wir erinnern uns all der berühmten Männer, welche dazu beigetragen haben, durch ihre Leistungen den Beruf des Lebensversicherungs-Technikers in seiner wahren Bedeutung zur Geltung

express the sentiments which we have experienced in not only honouring the names of Bailey, Finlaison, Sprague, and many others, but also having the pleasure of greeting the bearers of those names in person in this circle.

Further, we have to *thank* the members of the Institute of Actuaries for the exceedingly hearty reception which they have accorded us, both as representatives of Corporate Bodies, and as individual members of the Congress. Among us on the Continent, the English have the reputation of being very reserved and "buttoned up." We have not experienced this. Both officially and unofficially we have met with the kindest welcome, the memory of which will not fade away.

In conclusion, let me refer to the occasion of our gathering to-night, namely, to celebrate the fiftieth anniversary of the Institute of Actuaries. These fifty-year jubilees are somewhat peculiar. Among the ladies, a time comes, generally about the age of thirty, sometimes a good deal earlier, when they do not care to be reminded of their birthdays any longer. With us men fifty is the outside limit for the same feeling to arise. I know this by experience, for I have just about reached that age myself. But it is quite otherwise with a corporate body like the Institute of Actuaries. Such a body resembles a sturdy oak tree, which at fifty years of age is just commencing to live and thrive; which from year to year drives its roots more deeply into the earth, from year to year increases the girth of its mighty trunk, from year to year sends forth fresh twigs, and spreads its branches further and further around. Only the leaves are mortal. They wither and fall off; they may be compared to the individual members which form the Society. But the Society itself, the tree, lives, blooms, and grows. And on this day, the Jubilee festival of the Institute of Actuaries, we salute that body from our whole hearts, with the words:

Vivat, floreat, crescat.

zu bringen, welche zum grössten Teile aus diesem Institute hervorgegangen sind und von denen wir einige noch heute in unserer Mitte zu sehen das Vergnügen haben. Es ist fast unmöglich, auszudrücken, mit welchen Empfindungen wir nicht nur die Namen Bailey, Finlaison, Sprague und so viele andere, sondern die Träger dieser Namen in Person in diesem Kreise begrüsst haben.

Wir haben ferner den Mitgliedern des Institute of Actuaries zu *danken* für die ausserordentlich herzliche Aufnahme, welche Sie uns sowol als Corporation wie als einzelne Mitglieder bereitet haben. Bei uns auf dem Continente gelten die Engländer vielfach als zurückhaltend und zugeknöpft. Wir haben das nicht erfahren. Wir haben officiell und nicht officiell das liebenswürdigste Entgegenkommen gefunden, dessen Erinnerung bei uns nicht erlöschen wird.

Endlich haben wir uns hier vereinigt, um das *fünfzigjährige Bestehen* des Institute of Actuaries zu feiern. Mit solchen fünfzigjährigen Jubeltagen ist es eine eigene Sache. Bei den Damen beginnt das Alter, wo sie nicht mehr gern von ihrem Geburtstage reden hören, schon erheblich früher, etwa bei dreissig. Bei uns Männern ist fünfzig die äusserste Grenze—ich weiss das aus Erfahrung, denn ich werde nächstens auch fünfzig Jahr alt. Anders bei einer Körperschaft wie das Institute of Actuaries. Eine solche Körperschaft gleicht einem kräftigen Eichbaume, der mit fünfzig Jahren erst recht anfängt zu leben, der von Jahr zu Jahr seine Wurzeln tiefer treibt, von Jahr zu Jahr seinen Stamm machtvoller entwickelt, von Jahr zu Jahr seine Aeste und Zweige weiter ausbreitet. Die einzelnen Blätter verwelken und fallen ab, das sind die einzelnen Menschen, die den Verein bilden; aber die Vereinigung, der Baum, lebt, blüht und wächst. Und darum rufen auch wir dem Institute of Actuaries bei seiner Jubelfeier am heutigen Tage aus ganzem Herzem zu:

Vivat, floreat, crescat.

Dr. S. R. J. Van Schevichaven said:—Mr. President and Gentlemen—In my character as a delegate of the Life Managers' Association in the Netherlands, I have the honour to bring you the greetings and the declaration of sympathy of

your brethren in Holland. It is Mr. Young himself, the President of the Congress, who has written an article in the *Year-Book* of our Association, wherein he commemorates the joint labours of the old Englishmen and the old Dutchmen in relation to actuarial science. Therefore it is a great pleasure, and a great honour for me, to bring him, as representing the Institute of Actuaries, not only the declarations of sympathy and respect, but also the thanks, of my brethren for his kindly feeling towards our nation, and also for all the blessings which the English Institute of Actuaries has spread over the whole civilized world. I hope that the friendly feeling between the actuaries of the Netherlands and those of England and the other nations will be strengthened again and again in the long series of years yet to come.

Toast of "The President."

M. Léon Marie, in proposing the toast of the President, said :—

Gentlemen, and if I may be permitted to so style you, dear brethren, I rise to propose the last toast, which will assuredly not be the least cordially welcomed by you. After having rendered traditional and respectful honour to the Queen, you have successively drunk to the Institute of Actuaries, of which we are celebrating to day the glorious Jubilee; to the Second International Actuarial Congress, so successfully organized by the most ancient actuarial society of the whole world; and to the guests whom our English friends have received in a way so graceful and so cordial. You will think with me, no doubt, that it now remains to us to perform one last and very agreeable duty in drinking to the health of the eminent actuary, who for the past two years has presided with so much dignity over the Institute of Actuaries, who has guided with so much skill the organization of our Congress and the work of our meetings, and who has received in a manner so courteous, and I may add, in a manner so friendly, the guests who have come to London from all quarters of the world. The esteemed actuary of a great assurance company, Mr. Young has made himself known for a long time past by his writings, impressed with a truly scientific spirit, and a high philosophy. You have all read his masterly analysis of the pensions for old age and infirmity in Germany, because, after having been published in English, it was translated into French by the son of one of the most eminent actuaries of Belgium, whose absence from our Congress we have so much regretted. Not satisfied with having brought to the practice of

Messieurs, et si vous voulez bien me permettre de vous nommer ainsi, chers confrères, je viens vous proposer un dernier toast qui ne sera certes pas le moins chaudement accueilli par vous. Après avoir rendu le traditionnel et respectueux hommage à S. M. la Reine, vous avez successivement bu à l'Institute of Actuaries, dont nous célébrons aujourd'hui le glorieux Jubilé, au deuxième Congrès international d'Actuaires, si heureusement organisé par la doyenne des Associations actuarielles du monde entier, et enfin aux hôtes que nos amis anglais ont reçus d'une façon si gracieuse et si cordiale. Vous pensez sans doute, comme moi, qu'il vous reste maintenant à remplir un dernier et bien agréable devoir, en buvant à l'éminent actuaire qui, depuis deux années, préside avec tant d'autorité l'Institute of Actuaries, qui a dirigé avec une si grande compétence l'organisation de notre Congrès et les travaux de nos Séances, qui a reçu enfin de façon si courtoise et je dirai même si amicale les hôtes venus à Londres de tous les points du globe. Actuaire très apprécié d'une importante Compagnie d'Assurances, M. T. E. Young s'est fait depuis longtemps connaître par ses écrits empreints d'un véritable esprit scientifique et d'une haute philosophie. Vous avez tous lu sa remarquable étude sur les pension de vieillesse et d'invalidité en Allemagne, car, après avoir été publiée en langue anglaise, elle a été traduite en français par le fils d'un des plus distingués actuaires belges, dont l'absence fut si vivement regrettée pendant notre Congrès. Non content d'apporter dans l'exercice de notre chère profession un savoir et une hauteur

our loved profession a knowledge and an elevation of tone which have placed him in the front rank, Mr. Young has also devoted himself to scientific researches of another kind, which have led to his joining the ranks of the Fellows of the Royal Astronomical Society. He has thus shown once again that all sciences are sisters, and that a a man of lofty aspirations may devote himself to them all with equal ease. As I said a moment ago, it is Mr. Young who made the arrangements for our deliberations, and a great part of the success achieved by our Congress is indubitably due to him. Also, when with acclamation we called him to the Presidential chair, we had a double end in view. We desired, in the first place, to pay tribute to his exceptional gifts, and to thank him for what he had already done to secure the success of the Congress. But we desired besides, to place in well-tried hands the duty of guiding our deliberations, and to make them bear fruit in the development of actuarial science. You know how our legitimate hopes have been realized, and it is with all your heart that you will join with me in drinking to the health of Mr. Young, President of the Institute of Actuaries, and of the Second International Actuarial Congress.

d'esprit qui l'ont placé au premier rang, M. Young s'est encore livré à des recherches scientifiques d'un autre ordre, qui l'ont conduit à prendre place parmi les Membres de la Société Royale des Astronomes. Il a montré ainsi une fois de plus que toutes les sciences sont sœurs, et qu'un esprit élevé peut les aborder toutes avec d'égales facilités. Comme je le rappelais à l'instant, c'est M. Young qui a conduit la préparation de nos travaux, et une grande partie du succès obtenu par notre Congrès doit lui revenir sans conteste. Aussi, quand nous l'avons appelé, par acclamations, au fauteuil de la Présidence, nous nous proposions d'atteindre un double but. Nous désirions évidemment, tout d'abord, rendre hommage à son rare mérite, et le remercier de ce qu'il avait déjà fait pour assurer l'organisation de notre Congrès. Mais nous voulions, en outre, remettre en des mains éprouvées le soin de guider nos séances et de les rendre fructueuses pour le développement de la science actuarielle. Vous savez comment nos légitimes espérances ont été réalisées, et c'est de tout cœur que vous vous joindrez à moi, pour boire à M. T. E. Young, Président de l'Institute of Actuaries et du deuxième Congrès International d'Actuaires.

The Chairman, in reply, said: I very cordially thank you, M. Marie, for the kind words which you have spoken, and you, gentlemen, for the equally kind manner in which you have accepted those words as your own. However, I feel, gentlemen, that I ought rather to thank you than to receive your thanks, since the unaffected cordiality which has prevailed during our meetings, finding its fitting culmination in the present gathering, has converted the official duties of a chairman into the easy pleasures of a guest. Without detaining you with any remarks in connection with the Congress, I would simply ask your permission to state personally that to me it has been a signal honour to have been privileged to preside over your deliberations. I humbly and gratefully thank you for the consistent courtesy and unfailing forbearance with which you have repaid my genuine but imperfect efforts to act worthily of your trust. This evening, gentlemen, forms the final scene of our proceedings; the Congress, I conceive, could not pass into history in a happier way; and with our memories fresh with the recollections of the pleasant intercourse which we have enjoyed together, I bid you, in the name of the Institute, both as a body and as individual members, a genuinely regretful farewell.

The proceedings concluded with the singing of "Auld Lang Syne", the entire company joining hands.

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	Secretary, Dr. Grosse, Goltzstrasse 28 III., Berlin, W.
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General Manager and Actuary of the Caledonian Insurance Company, 19, George Street, Edinburgh.

MEIKLE, JAMES, F.S.S. (Vice-President of the Faculty of Actuaries in Scotland),
Actuary of the Scottish Provident Institution, 6, St. Andrew Square, Edinburgh).

SPRAGUE, THOMAS BOND, M.A., LL.D., F.S.S., F.R.S.E.,
Actuary and Manager of the Scottish Equitable Life Assurance Society, 26, St. Andrew Square, Edinburgh.

TURNBULL, ANDREW HUGH, F.R.S.E.,
Manager and Actuary of the Scottish Widows' Fund Life Assurance Society, 9, St. Andrew Square, Edinburgh.

LOW, G. M., F.R.S.E.,
Manager of the Edinburgh Life Assurance Company, 22, George Street, Edinburgh.

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Actuary of the Washington Life Insurance Company, New York.

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Sous-Directeur et Actuaire de la Compagnie Belge d'Ass. Générales sur la vie, Brussels.

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Directeur-Général de la Caisse Générale d'Epargne et de Retraite, Brussels.

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Sous-Directeur et Actuaire de la Compagnie Belge d'Assurances Générales sur la vie, Brussels.

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Directeur-Général de la Caisse Générale d'Epargne de Retraite, Brussels.

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Secretaire du Directeur-Général et Actuaire de la Caisse Générale d'Epargne et de Retraite, Brussels.

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Premier Directeur de la Caisse Générale d'Epargne et de Retraite, Brussels.

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Directeur-Général de la Caisse Générale d'Epargne et de Retraite, Brussels.

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FONTAINE, ARTHUR,
Sous-Directeur de l'Office du Travail, 80 Rue de Varennes, Paris.

WEBER, LOUIS,
Actuaire de l'Office du Travail, 12, Rue Cauchois, Paris.

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JOBIT, M.,
Sous-Inspecteur de l'Enregistrement, 106, Rue de Miromesnil, Paris.

Delegates of the Institut des Actuaires Francais.

COHEN, JULES,
Actuaire de la Caisse Paternelle et de la Confiance 1, Rue de Lille, Paris.

MARIE, LÉON (Vice-President of the Congress for France),
Actuaire de la Compagnie le Phénix, 32 Rue Jouffroy, Paris.

QUIQUET, ALBERT (Secretary of the Congress for France),
Actuaire de la Compagnie la Nationale, 92 Boulevard St. Germain, Paris.

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Attaché a la Caisse des Depôts et Consignations, 56 Rue de Lille, Paris.

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Ackland, Thomas Gans, F.S.S.,
Avalon, 71, Morland Road, Croydon.

Addiscott, Francis,
Secretary of the Medical Sickness, Annuity, and Life Assurance Society, 33, Chancery Lane, W.C.

Adlard, Alfred Barton,
Actuary of the Law Life Assurance Society, 187, Fleet Street, E.C.

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The Equitable Life Assurance Society, Mansion House Street, E.C.

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Actuary of the Alliance Assurance Company, Bartholomew Lane, E.C.

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Andras, Henry Walsingham, F.S.S.,
Secretary of the University Life Assurance Society, 25, Pall Mall, S.W.

Armstrong, J. R.,
Scottish Provident Institution, Edinburgh.

Bailey, Arthur Hutcheson, F.S.S.,
26, Mount Ephraim Road, Streatham, S.W.

Barnes, Joseph Howard, F.S.S.,
Assistant Actuary of the Pelican Life Insurance Company, 70, Lombard Street, E.C.

Barrand, Arthur Rhys,
Prudential Assurance Company, Holborn Bars, E.C.

Barton, Arthur,
United Kent Insurance Institution, Maidstone.

Bell, Frederick,

Sub-Manager and Joint Actuary of the Imperial Life Insurance Company, 1, Old Broad Street, E.C.

Berridge, George William,

Dunton Lodge, The Knoll, Beckenham, Kent.

Berry, Berry Alfred, B.A.,

Assistant Actuary of the London Life Association, Limited, 81, King William Street, E.C.

Besant, Arthur Digby, B.A.,

Clerical, Medical and General Life Assurance Society, 15, St. James' Square, S.W.

Blakey, James,

National Debt Office, 19, Old Jewry, E.C.

Bourne, James Pearce,

6, Frederick Place, Clifton, Bristol.

Bowser, W. A.,

Consulting Actuary, 8, Union Court, Old Broad Street, E.C.

Brabrook, E. W., C.B.,

Chief Registrar of Friendly Societies, 28, Abingdon Street, S.W.

Brown, Edward Harold,

Prudential Assurance Company, Holborn Bars, E.C.

Brown, George Andrew,

Superintendent of Agents, Clerical, Medical and General Life Assurance Society, 15, St. James's-square, S.W.

Browne, E. W., F.S.S.,

London Manager of the Colonial Mutual Life Assurance Society, Limited, 33, Poultry, E.C.

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General Manager and Secretary of the Employers' Liability Assurance Corporation, 84 & 85, King William Street, E.C.

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Assistant Actuary of the Clergy Mutual Assurance Society, 2 & 3, The Sanctuary, Westminster, S.W.

Calderon Henry Philip,

Institute of Actuaries, Staple-inn-hall, Holborn, W.C.

Carment, D. M.,

Assistant Actuary of the Commercial Union Assurance Company, Limited, 24, 25 & 26, Cornhill, E.C.

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Secretary and Actuary of the Scottish Life Assurance Company, 19, St. Andrew Square, Edinburgh.

Chisholm, James (Treasurer of the Institute of Actuaries),

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Manager and Actuary of the London and Lancashire Life Assurance Company, 66 & 67, Cornhill, E.C.

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Life Manager and Actuary of the North British and Mercantile Insurance Company, 61, Threadneedle Street, E.C.

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Joint Secretary of the Scottish Provident Institution, 6, St. Andrew Square, Edinburgh.

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Actuary of the Eagle Insurance Company, 79, Pall Mall, S.W.

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Actuary of the Atlas Assurance Company, 92, Cheapside, E.C.

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Day, Archibald,

Clifton Lodge, St. John's Road, Blackheath, S.E.

Day, Stanley,

Actuary and Secretary of the Marine and General Mutual Life Assurance Society, 14, Leadenhall Street, E.C.

Deuchar, David, F.R.S.E. (Vice-President of the Congress for the United Kingdom, President of the Faculty of Actuaries in Scotland),

General Manager and Actuary of the Caledonian Insurance Company, 19, George Street, Edinburgh.

Dewey, Thomas Charles,

Manager of the Prudential Assurance Company, Holborn Bars, E.C.

Douglas, Gordon,

Actuary of the Life Association of Scotland, 82, Princes Street, Edinburgh.

Duncan, John,

Secretary and Actuary of the Clergy Pensions Institution and Ecclesiastical Insurance Office, 11, Norfolk Street, Strand, W.C.

Eccles, Yvon Richard,

London Secretary of the Scottish Amicable Life Assurance Society, 1, Threadneedle Street, E.C.

Faulks, Joseph Ernest, B.A., F.S.S.,

Assistant Actuary of the Law Life Assurance Society, 187, Fleet Street, E.C.

Fellows, Rowland Hill, F.S.S.,

British Empire Mutual Life Assurance Co., 4 & 5, King William Street, E.C.

Fenton, Jas.,

North British & Mercantile Insurance Company, 64, Princes Street, Edinburgh.

Findlay, Alexander Wynaud,

Prudential Assurance Company, Holborn Bars, E.C.

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Actuary of the National Debt Office, 19, Old Jewry, E.C.

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Sub-Manager of the Prudential Assurance Company, Holborn Bars, E.C.

Foot, Herbert, B.A.,

Northern Assurance Company, 1, Moorgate Street, E.C.

Fraser, A., Jun.,

Edinburgh Life Assurance Company, 22, George Street, Edinburgh.

Fraser, Duncan Cumming, M.A.,

Royal Insurance Company, North John Street, Liverpool.

Fulford, Frederick Wesley,

Prudential Assurance Company, Holborn Bars, E.C.

Galer, Frederic Bertram, B.A.,

Rock Life Assurance Society, 15, New Bridge Street, E.C.

Goodwyn, John, Jun.,

Norwich & London Accident Insurance Assoc., 1, Lakenham Terrace, Norwich.

Gunn, Niel Ballingal,

Manager of the Scottish Amicable Life Assurance Society, 35, St. Vincent Place, Glasgow.

Haldeman, D. C.,

British Manager of the Mutual of New York, 17 & 18, Cornhill.

Hall, John Francis Edmund,

Eagle Insurance Company, 79, Pall Mall, S.W.

Harben, Sir Henry,

Prudential Assurance Company, Holborn Bars, E.C.

Hardcastle, Edward Edgington, M.A.,

Institute of Actuaries, Staple Inn Hall, Holborn, W.C.

Hardy, George Francis, F.S.S.,

Actuary of the English & Scottish Law Life Assurance Association, 12, Waterloo Place, S.W.

Hardy, Ralph Price,

Consulting Actuary, 17, Gracechurch Street, E.C.

Harris, Henry,

Friend's Provident Institution, Bradford.

Hart, James Robert,

British Empire Mutual Life Assurance Company, 4 & 5, King William Street, E.C.

Hemming, Arthur George, F.S.S.,

London Secretary of the City of Glasgow Life Assurance Company, 12, King William Street, E.C.

Hendriks, Augustus, F.S.S.,

Actuary and London Secretary of the Liverpool and London and Globe Insurance Company, 7, Cornhill, E.C.

Hendriks, Frederick, F.S.S.,

Actuary and Secretary of the Universal Life Assurance Society, 1, King William Street, E.C.

Higham, Charles Daniel,

Actuary and Secretary of the London Life Association, Limited, 81, King William Street, E.C.

Hodgson, William Horsford,

Life Association of Scotland, 5, Lombard-street, E.C.

Holliday, John, M.A.,

Institute of Actuaries, Staple Inn Hall, Holborn, W.C.

Holt, Edward Hallett,

Manager and Secretary of the Law Life Assurance Society, 187, Fleet Street, E.C.

Hopkins, William Raynes,

Assistant Actuary of the London and Lancashire Life Assurance Company, 66 & 67, Cornhill, E.C.

Hovil, Lewis Frederick,

Assistant Actuary of the Economic Life Assurance Society, 6, New Bridge Street, E.C.

Hughes, William, Vice-President of the Institute of Actuaries,

Manager of the Prudential Assurance Company, Holborn Bars, E.C.

Hunt, Richard Aldington, F.S.S.,

General Manager of the Wesleyan and General Assurance Society, Corporation Street, Birmingham.

Hutcheson, William Anderson,

Scottish Widows' Fund Life Assurance Society, 28, Cornhill, E.C.

Hutton, William,

Assistant Secretary of the Scottish Amicable Life Assurance Society, 1, Threadneedle Street, E.C.

Jackson, A.,

General Manager of the English and Scottish Law Life Assurance Association, 12, Waterloo Place.

Jellicoe, George Rogers,

Secretary and General Manager of the Eagle Insurance Company, 79, Pall Mall, S.W.

Kentish, Owen,

Economic Life Assurance Society, 6, New Bridge Street, E.C.

King, George,

Actuary of the London Assurance Corporation, 7, Royal Exchange, E.C.

Kyd, Thomas,

Resident Manager of the Northern Assurance Company, 1, Union Terrace, Aberdeen.

Laing, Francis,

Actuary of the Northern Assurance Company, 1, Moorgate Street, E.C.

Laing, William Claud,

Pioneer Life Assurance Company, Limited, 11, Dale Street, Liverpool.

Lancaster, William John,

Secretary of the Prudential Assurance Company, Holborn Bars, E.C.

Lemon, William Kent,

3, Royal Exchange Buildings, E.C.

Leveaux, Arthur Michael,

Registry of Friendly Societies, Central Office, 28, Abingdon Street, Westminster, S.W.

Levine, Abraham, M.A.,

National Mutual Life Assurance Society, 39, King Street, Cheapside, E.C.

Lidstone, George James,

Assistant Actuary of the Alliance Assurance Company, Bartholomew Lane, E.C.

Low, George M., F.R.S.E.,

Manager of the Edinburgh Life Assurance Company, 22, George Street, Edinburgh.

Lutt, Harold Edward William,

Commercial Union Assurance Company, 24, 25 & 26, Cornhill, E.C.

Mackay, Alexander,

General Manager of the Law Union & Crown Fire & Life Insurance Company, 126, Chancery Lane, W.C.

Mackenzie, Alexander George,

Hillside, Marischal Road, Lee, S.E.

Maclagan, P. R. D., F.R.S.E.,

Manager of the North British & Mercantile Insurance Company, 64, Princes Street, Edinburgh.

McLauchlan, J. J.,

Secretary of the Scottish Equitable Life Assurance Society, 26, St. Andrew Square, Edinburgh.

Manly, Henry William, (Vice-President of the Congress for the United Kingdom; Vice-President of the Institute of Actuaries),

Actuary of the Equitable Life Assurance Society, Mansion House Street, E.C.

Marchbank, Frank,

North British and Mercantile Insurance Company, Newcastle-on-Tyne.

Marks, Geoffrey,

Actuary and Manager of the National Mutual Life Assurance Society, 39, King Street, Cheapside, E.C.

Marr, Vyvian,

Edinburgh Life Assurance Company, 22, George Street, Edinburgh.

May, George Ernest,

Prudential Assurance Company, Holborn Bars, E.C.

McDonald, John,

Prudential Assurance Company, Holborn Bars, E.C.

Meikle, James, F.S.S. (Vice-President of the Faculty of Actuaries in Scotland),

Actuary of the Scottish Provident Institution, 6, St. Andrew Square, Edinburgh.

Miller, John W.,

London Secretary of the Scottish Widows' Fund Life Assurance Society, 28, Cornhill, E.C.

Molyneux, Arthur Ernest,

Provident Clerks' Mutual Life Assurance Association, 27 & 29, Moorgate Street, E.C.

Moon, James,

Prudential Assurance Company, 30, Dale Street, Liverpool.

Moon, John,

Superintendent of the Prudential Assurance Company, 80, King Street, Manchester.

Moorhouse, Alfred,

Friends' Provident Institution, Bradford.

Morgan, Benjamin Charles,

Commercial Union Assurance Company, 24, 25 & 26, Cornhill, E.C.

Nash, Willie Oscar,

Actuary of the Law Reversionary Interest Society, Limited, 24, Lincoln's Inn Fields, W.C.

Neison, Francis G. P., F.S.S.,

Consulting Actuary, 19, Abingdon Street, Westminster, S.W.

Newman, P. L., B.A.,

Actuary of the Yorkshire Insurance Company, York.

Nicol, W. S.,

Assistant Manager of the City of Glasgow Life Assurance Society, 30, Renfield Street, Glasgow.

Nicoll, John,

Life Assurance of Scotland, 82, Princes Street, Edinburgh.

Nightingale, Harry Ethelston,

Actuary of the Royal Exchange Assurance Corporation, Royal Exchange, E.C.

Pagden, Lionel King,

Actuary of the Union Assurance Society, 81, Cornhill, E.C.

Park, David Francis, C.A.,

Crédit Foncier of Mauritius (Limited), 39, Lombard Street, E.C.

Pearce, H. J.,

29, St. Vincent Place, Glasgow.

Pearson, Arthur,

Betchworth House, The Bank, Highgate, N.

Phelps, William Peyton, M.A.,

Assistant Actuary of the Equity and Law Life Assurance Society, 18, Lincoln's Inn Fields, W.C.

Povah, Charles,

Sub-Manager of the Lancashire Insurance Company, Exchange Street, St. Ann's Square, Manchester.

Price, William John,

Assistant Secretary of the Life Association of Scotland, 5, Lombard Street, E.C.

Price-Williams, R.,

32, Victoria Street, Westminster.

Rattray, Patrick, C.A.,

Gresham House, 45, West Nile Street, Glasgow.

Rea, Charles, H. E., F.R.A.S., F.S.S.,

Actuary of the Pearl Life Assurance Company, London Bridge, E.C.

Reid, Walter A.,

Consulting Actuary, Canada House, Aberdeen.

Rolland, J. H. W., C.A.,

General Secretary for England of the Standard Life Assurance Company, London.

Rusher, Edward Arthur, F.S.S.,

Prudential Assurance Company, Holborn Bars, E.C.

Ryan, Gerald Hemmington (Vice-President of the Institute of Actuaries),

General Manager and Actuary of the British Empire Mutual Life Assurance Company, 4 & 5, King William Street, E.C.

Salmon, Richard George,

Sun Life Assurance Society, 63, Threadneedle Street, E.C.

Schooling, Frederick (Joint Hon. Librarian of the Institute of Actuaries),

Actuary of the Prudential Assurance Company, Holborn Bars, E.C.

Schooling, Wm.,

Fairholme, Christchurch Road, Surbiton.

Searle, George Morley,

Sun Life Assurance Society, 63, Threadneedle Street, E.C.

Sewell, Richard, C.A.,

Actuary of the Sun Life Assurance Society, 63, Threadneedle Street, E.C.

Sheppard, Herbert Norman, B.A.,

Institute of Actuaries, Staple Inn Hall, Holborn, W.C.

Sim, William Abernethy,

Scottish Union & National Insurance Company, 35, St. Andrew Square, Edinburgh.

Simon, Louis Michael,

Actuary and Secretary of the Metropolitan Life Assurance Society, 13, Moorgate Street, E.C.

Smith, J. T., LL.D.,

Manager of the Life Association of Scotland, 82, Princes Street, Edinburgh.

Smith, W. A.,

Edinburgh Secretary and Manager of the English and Scottish Law Life, 120, Princes Street, Edinburgh.

Smither, Arthur,

Actuary and Secretary of the National Provident Institution, 48, Gracechurch Street, E.C.

Sorley, James, C.A., F.R.S.E.,

Actuary and General Manager of the Pelican Life Insurance Company, 70, Lombard Street, E.C.

Spencer, John,

English and Scottish Law Life Assurance Association, 12, Waterloo Place, S.W.

Sprague, Thomas Bond, M.A., LL.D., F.S.S., F.R.S.E.,

Actuary and Manager of the Scottish Equitable Life Assurance Society, 26, St. Andrew Square, Edinburgh.

Stable, D. W.,

Prudential Assurance Company, Holborn Bars, E.C.

Stahlschmidt, Louis,

Imperial Life Insurance Company, 1, Old Broad Street, E.C.

Stirling, R.,

Joint Actuary of the Law Union and Crown Fire and Life Insurance Company, 126, Chancery Lane, W.C.

Stuart, J. M.,

16, St. Helen's Place, E.C.

Stevens, Charles,

Actuary and Secretary of the Provident Life Assurance Company, 50, Regent Street, W.

Straker, Edward Robert,

Assistant Actuary of the British Empire Mutual Life Assurance Company, 4 & 5, King William Street, E.C.

Straker, Frank Arthur,

Assistant Actuary of the Legal and General Life Assurance Society, 10, Fleet Street, E.C.

Strong, William Richard,

London Guarantee and Accident Company, 61, Moorgate Street, E.C.

Tarn, Arthur Wyndham,

Westminster and General Life Assurance Association, 28, King Street, Covent Garden, W.C.

Tennant, John Bell,

Secretary and Actuary of the Friends' Provident Institution, Bradford, Yorkshire.

Terry, James,

17, Kidbrook Park Road, Blackheath, S.E.

Thiselton, Herbert Cecil,

Actuary of the Hand-in-Hand Insurance Society, 26, New Bridge Street, E.C.

Thomson, Herbert Archer, B.A.,

Assistant Actuary of the Hand-in-Hand Insurance Society, 26, New Bridge Street, E.C.

Thomson, Spencer Campbell, B.A.,

Manager and Actuary of the Standard Life Assurance Company, 3, George Street, Edinburgh.

Thorne, Alfred Charles,

Equity and Law Life Assurance Society, 18, Lincoln's Inn Fields, W.C.

Tilt, Robt. Ruthven,

Assistant Actuary of the General Reversionary and Investment Company, Limited, 5, Whitehall, S.W.

Todd, George, M.A.,

Actuary and Secretary of the Economic Life Assurance Society, New Bridge Street, E.C.

Todhunter, Ralph, M.A.,

Assistant Actuary of the National Mutual Life Assurance Society, 39, King Street, Cheapside, E.C.

Turnbull, A. D. Lindsay, C.A.,

Assistant Secretary of the Caledonian Insurance Company, 19, George Street, Edinburgh.

Turnbull, Andrew Hugh, F.R.S.E.,

Manager and Actuary of the Scottish Widows' Fund Life Assurance Society, 9, St. Audrew Square, Edinburgh.

Vincent, Frederick James, F.S.S.,

London Edinburgh & Glasgow Assurance Company, Limited, Insurance Buildings, Farringdon Street, E.C.

Wallace, Thomas (Honorary Secretary of the Faculty of Actuaries in Scotland),

Actuary of the North British and Mercantile Insurance Company, Edinburgh.

Warner, Samuel George,

Actuary and Secretary of the Law Union and Crown Insurance Company, 126, Chancery Lane, W.C.

Watson, Alfred William,

Manchester Unity Friendly Society, Nottingham.

Watson, James Douglas,

Assistant Actuary of the English and Scottish Law Life Assurance Association, 12, Waterloo Place, S.W.

Watson, Reuben,

Manchester Unity Friendly Society, Nottingham.

Weeden, Charles Thomas,

London Assurance Corporation, 7, Royal Exchange, E.C.

Whittall, William Joseph Hutchings (Joint Honorary Librarian of the Institute of Actuaries),

Actuary and Secretary of the Clerical, Medical and General Life Assurance Society, 15, St. James's Square, S.W.

Wilson, Henry Edward,

General Manager of the Northern Assurance Company, 1, Moorgate Street, E.C.

Wilson, Robert, Jun.,

Actuary of the General Assurance Company, 103, Cannon Street, E.C.

Windett, Charles,

Assistant Manager of the Legal and General Life Assurance Society, 10, Fleet Street, E.C.

Woods, Ernest,

Actuary of the Westminster and General Life Assurance Association, 28, King Street, Covent Garden, W.C.

Wyatt, Frank Bertrand (Secretary of the Congress for the United Kingdom; Joint Honorary Secretary of the Institute of Actuaries),

Actuary of the Clergy Mutual Assurance Society, 2 & 3, The Sanctuary, S.W.

Yardley, John,

Prudential Assurance Company, Holborn Bars, E.C.

Young, Thomas Emley, B.A. (President of the Congress: President of the Institute of Actuaries),

Actuary of the Commercial Union Assurance Company, Limited, 24, 25 & 26, Cornhill, E.C.

AUSTRALIA.

Carment, David,
Australian Mutual Provident Society, Sydney, New South Wales.

Dovey, William Roadly,
Citizens' Life Assurance Company, Sydney, Australia.

Elliott, Charles Alfred,
Australian Mutual Provident Society, Sydney, New South Wales.

Gillison, John Brotch,
National Mutual Life Association of Australasia, Limited, Melbourne, Victoria.

Graham, James,
Australian Widows' Fund Life Assurance Society, Melbourne, Australia.

Laughton, Alexander Millar,
National Mutual Life Association of Australasia, Limited, Melbourne, Victoria.

Norris, Charles Arthur,
National Mutual Life Association of Australasia, Limited, Melbourne, Victoria.

Owen, Evan Frederick, F.S.S.,
Office of the Actuary for Friendly Societies, Melbourne, Victoria.

Teece, Richard, F.S.S.,
Australian Mutual Provident Society, Sydney, New South Wales.

Thodey, Robert,
Australian Mutual Provident Society, Sydney, New South Wales.

Wickens, Charles H.,
Registrar-General's Office, Perth, Western Australia.

AUSTRIA-HUNGARY.

Altenburger, Julius (Vice-President of the Austro-Hungarian Society of Actuaries),
Actuary and Chief of the Life Department of the Riunione Adriatica di Sicurtà, Trieste.

Czuber Emanuel (President of the Austro-Hungarian Society of Actuaries),
Professor at the Polytechnicum, Vienna.

Klang, Dr. James,
Versicherungs-Gesellschaft "Oesterr Phönix," Vienna.

Kögler, Karl,
Director of the "Arbeiter-Unfallversich. Anstalt für Niederösterreich," Schottenbastei, 10, Wien.

Paul, Ferdinand (Vice-President of the Austro-Hungarian Society of Actuaries),

Actuary of the "Elsö magyar általános biztositó társaság," Budapest.

Vargha, Alexander,

Director of the "Nemzeti balesetbiztositó részvény társaság," VII. Erzsébet-Körút, Budapest.

BELGIUM.

Adan, H. (President de l'Association des Actuaires Belges),

Directeur-Général de la Compagnie d'assurances, La Royale Belge, Brussels.

Bégault, Am. (Vice-President of the Congress for Belgium; Membre agrégé de l'Association des Actuaires Belges),

Sous-Directeur et Actuaire de la Compagnie Belge d'Ass. Générales sur la Vie, Brussels.

Caisse Générale d'Epargne et de Retraite,

Brussels.

Capouillet, P.,

Directeur-Général des Cies. Belges d'Ass: générales sur la vie et contre les risques d'incendie, Brussels.

Deroover, E. (Membre agrégé de l'Association des Actuaires Belges),

Directeur à la Caisse Générale d'Epargne et de Retraite, Brussels.

Duboisdenghien, Léon (Secretary of the Congress for Belgium; Secretaire de l'Association des Actuaires Belges),

Secretaire du Directeur-Général et Actuaire de la Caisse Générale d'Epargne et de Retraite, Brussels.

Hamoir, L.,

Directeur de la Cie. d'Ass: Les Propriétaires Réunis, Brussels.

Hankar, F. (Membre agrégé de l'Association des Actuaires Belges),

Premier Directeur à la Caisse Générale d'Epargne et de Retraite, Brussels.

Le Jeune, Ch.,

Courties d'Ass: et dispâcheur, Antwerp.

Lepreux, O. (Vice-President de l'Association des Actuaires Belges),

Directeur-Général de la Caisse Générale d'Epargne et de Retraite, Brussels.

Mahillon, Dr.,

Chargé du service médical de la Caisse Générale d'Epargne et de Retraite, Brussels.

Maingie, L. (Membre agrégé de l'Association des Actuaires Belges),
Actuaire adjoint a la Cie. Belge d'Ass: générales sur la vie, Brussels.

Meerens, Léon,
Attaché au contentieux de la Caisse Générale d'Epargne et de Retraite, Brussels.

Meeûs, —,
Attaché à la Cie. d'Ass: La Royale Belge, Brussels.

Montefiore-Levi,
Sénateur, 35, Rue de la Science, Brussels.

T'Kint de Roodenbeke, Baron,
Ministre d'Etat, Président du Sénat, Brussels.

Van der Rest,
Jurisconsulti Chargé du Contentieux de la Caisse Générale d'Epargne et de Retraite, Brussels.

Van Hoegaerden, V.,
Gouverneur de la Banque Nationale, Président du Conseil d'administration de la Caisse Générale d'Epargne et de Retraite, Brussels.

Waterkeyn, Joseph M.,
Banquier, Antwerp.

CANADA.

Bradshaw, T.,
Imperial Life Assurance Company of Canada, Toronto, Ontario.

Junkin, J. F.,
Manager, Manufacturers' Life Insurance Company, Toronto, Ontario.

Macaulay, T. B., F.S.S.,
Secretary and Actuary, Sun Life Assurance Company of Canada, Montreal, Canada.

Macdonald, W. C.,
Actuary, Confederation Life Association, Toronto, Ontario.

McCabe, William, F.S.S.,
Actuary, North American Life Assurance Company, Toronto, Ontario.

Ramsay, A. G., F.S.S.,
Canada Life Assurance Company, Hamilton, Ontario.

Richter, John G.,
Actuary, London Life Insurance Company, London, Ontario.

Hendry, William,
Manager, Ontario Mutual Life Assurance Company, Waterloo, Ontario.

DENMARK.

Billenstein, C. S.,
Actuary, Nationale Livsforsikringsselskab Dan, Fredericia.

Gamborg, V.,
Nygade 7 K, Copenhagen.

Krebs, Dr.,
Denmark Fire and Life Insurance Company, Copenhagen.

Statsanstalten for Livsforsikring,
Havnegade 23 K, Copenhagen.

Thiele, Dr. T. N. (Vice-President of Congress for Norway, Sweden and Denmark),
Observatoriet, Copenhagen, K.

FRANCE.

Abeille (Cie. d'Ass. sur la vie, L'),
57, Rue Taitbout, Paris.

Bellom, M.,
Ingr. au Corps des Mines, 6, Rue d'Aubigny, Paris.

Beuzon, Henri,
Dr. de la Cie. La Providence, 36, Rue du Marché, Neuilly sur Seine, Seine.

Bizos, Edouard,
Dr. de la Cie. l'Aigle, 60, Boulevard des Batignolles, Paris.

Caisse générale des Familles (Cie. d'Ass. sur la vie, La),
4, Rue de la Paix, Paris.

Caisse Paternelle (Cie. d'Ass. sur la vie, La),
4, Rue Ménars, Paris.

Caisse syndicale d'Ass. contre les Accidents des Forges de France,
2, Cité de Londres, Paris.

Cassal, Edouard,
Actuaire du Crédit Lyonnais, 27, Rue de St. Pétersbourg, Paris.

Chaufton, Albert,
Avocat au Conseil d'Etat et à la Cour de Cassation, 20, Rue Godot-de-Mauroi, Paris.

Cheysson, Emile,
Inspecteur général des Ponts et Chaussées, 4, Rue Adolphe-Yvon, Paris.

Cohen, Jules (Archiviste Bibliothécaire de l'Institut des Actuaires Francais),
Actuaire de la Caisse paternelle et de la Confiance, 1, Rue de Lille, Paris.

Comité central des Houillères de France,
55, Rue de Chateaudun, Paris.

Confiance (Cie. d'Ass. sur la vie, La),
2, Rue Favart, Paris.

Debrock, Louis,
Représentant de la Cie. La Fondiaria, 50, Chaussée d'Autin.

Duplaix, Hector,
Actuaire de la Cie. d'Ass. Générales, 58, Rue des Dames, Paris.

Foncière (Cie. d'Ass. sur la vie, La),
17, Rue Louis-le-Grand, Paris.

Fillod, Jean,
Directeur de la Cie. Le Monde, 58, Cité des Fleurs, Paris.

Fontaine, Arthur,
Sous Directeur de Office du Travail, 80, Rue de Varennes, Paris.

Fontaine, Louis (Trésorier de l'Institut des Actuaires Francais),
Actuaire de la Caisse des Dépôts et Consignations, 10, Rue de la Pompe, Paris.

France (Cie. d'Ass. sur la vie, La),
14, Rue de Grammont, Paris.

Fresnay, Ange du,
Directeur, de la Cie. Le Phénix, 33, Rue de Lafayette, Paris.

Guieysse, Paul (Président de l'Institut des Actuaires Francais),
Député, ancien Ministre des Colonies, 42, Rue des Ecoles, Paris.

Jobit, M.,
Sous Inspecteur de l'Enregistrement, 106, Rue de Miromesnil, Paris.

Kilford, G. W.,
2, Rue Grétry, Paris.

Labeyrie, O.,
Gouverneur du Crédit Foncier de France, 19, Rue des Capucines, Paris.

Laurent, Dr. Hermann (Vice-Président de l'Institut des Actuaires Francais),
Examinateur d'admission à l'Ecole polytechnique, 53, Rue Monsieur-le-Prince, Paris.

Lefort, —.,
Avocat au Conseil d'Etat et à la Cour de Cassation, 54, Rue Blanche, Paris.

Lenglet, Louis,
46, Rue des Abbesses, Paris.

Ligue nationale de la Prévoyance et de la Mutualité,
78, Rue Bonaparte, Paris.

Marie, Léon (Vice-President of the Congress for France, Secrétaire général de l'Institut des Actuaires Francais),
Actuaire de la Cie. Le Phénix, 32, Rue Jouffroy, Paris.

Massé, Léon,
Actuaire de la Cie. le Soleil, 68, Rue Nollet, Paris.

Matignon, F.,
Directeur Adjoint de la Cie. Le Phénix, 27, Rue Laffitte, Paris.

Morand de la Perrelle, Julien,
73, Rue du Lycée, Evreux (Eure).

Moulin, Paul,
Directeur de la Cie. Le Soleil, 22, Rue de la Banque, Paris.

Musée Social (Représenté par M. Léon Marie, sur Actuaire Conseil),
5, Rue Las-Cases, Paris.

Mutuelle Vie (Cie. d'Ass. sur la vie, La),
à Rouen (Seine inférieure).

Nord, (Cie. de Ass. sur la vie, Le),
20, Rue Le Peletier, Paris.

Oltramare, François,
Actuaire de la Cie. l'Union, 34, Rue de Madame, Paris.

Patel, Georges,
Attaché à la Caisse des Dépôts et Consignations, 56, Rue de Lille, Paris.

Patrimoine, (Cie d'Ass. sur la vie, Le)
55, Rue de la Chaussée d'Antin, Paris.

Poterin du Motel, Henri (Secrétaire de l'Institut des Actuaires Francais),
Actuaire Adjoint de la Cie. Le Phénix, 75, Boulevard St. Michel, Paris.

Prévoyance (Cie. d'Ass. contre les Accidents, La),
23, Rue de Londres, Paris.

Quiquet, Albert (Secretary of the Congress for France),
Actuaire de la Cie. La Nationale, 92, Boulevard St. Germain, Paris.

Soulier, Paul,
Actuaire de la Cie. des Chemins de fer de l'Etat, 16, Rue Caumartin, Paris.

Syndicat des Cies. d'Ass. contre les Accidents,
23, Rue de Londres, Paris.

Urbaine (Cie. d'Ass. sur la vie, L'),
8, Rue Le Peletier, Paris.

Weber, Louis,
Actuaire de l'Office du Travail (Ministere du Commerce), 80, Rue de Varennes, Paris.

GERMANY.

Amthor, Dr.,
Königstr, No. 40, Hannover.

Baumgartner, Eugen,
Strassburg. in Els.

Bloch, Dr. M.,
Cologne Re-insurance Co., Cologne.

Friedeberg, Dr. E.,
Gerichtsassessor; 36, Dorset Square, London, N.W.

Fröhlich, R.,
Victoria Ins. Soc. of Berlin, Lindenstr, No. 20/21, Berlin, S.W.

Gerkrath, Dr. (Vice-President of the Congress for Germany and Austria),
Nordstern Life Ins. Soc., Kaiserhofstr, No. 3, Berlin, W.

Gerkrath, A.,
State Reporter, Düsseldorf.

Goldschmidt, Dr. Ludwig,
Lebensversicherungs-Bank für Deutschland, Gotha.

Grosse, Dr. (Secretary of the Congress for Germany and Austria),
Goltzstrasse 28 III, Berlin, W.

Gunckel, Arthur,
Vaterländische Life Ins. Soc., Elberfeld.

Hahn, Dr. iur,
General Direktor der Wilhelma in Magdeburg.

Karup, Prof. Dr.,
Lebensversicherungs-Bank für Deutschland, Gotha.

Lebensversicherungs-und Ersparnis-Bank,
Stuttgart.

Marmetschke, —.,
Mathematiker der Hannoverschen Lebensversicherungs-Anstalt, Hannover.

Modrach, E.,
Lebensversicherungs-Gesellschaft zu Leipzig.

Rautmann, Dr.,
Wilhelma in Magdeburg.

Samwer, Dr.,
Lebensversicherungs-Bank für Deutschland, Gotha.

Teutonia Allgemeine Renten-Capital-und Lebensversicherungsbank,
Leipzig.

Unger, Dr.,
Neu-Weissensee bei, Berlin, Strassburgstrasse, 18.

Walther, Dr.,
Lebensversicherungs-Gesellschaft zu Leipzig.

GRAND DUCHY OF LUXEMBURG.

Eyschen, Paul,
Ministre d'Etat, Luxemburg.

Neuman, —.,
Conseiller d'Etat, Luxemburg.

HOLLAND.

Blankenberg, J. F. L.,
Algemeene Maatschappij van Levensverzekering en Lijfrente, Amsterdam.

Landré, Corneille L.,
Algemeene Maatschappij van Lebensverzekering en Lijfrente, Amsterdam.

Nationale Levensverzekering Bank,
Boompjes 9, Rotterdam.

"Oranje-Nassau" Life Insurance Company,
Keizersgracht 721, Amsterdam.

Paraira, Dr. M. C. (Vice-President of the Congress for Holland),
Nederland Ass. Co., Amsterdam.

Scott, E. W.,
Willemsparkweg 108, Amsterdam.

Van Dorsten, Dr. R. H. (Secretary of the Congress for Holland),
Nationale Levensverzekering Bank, Rotterdam.

Van Schevichaven, Dr. J.,
Algemeene Maatschappij van Levensverzekering en Lijfrente, Amsterdam.

Van Schevichaven, Dr. S. R. J.,
Algemeene Maatschappij van Levensverzekering en Lijfrente, Amsterdam.

"Vennootschap Nederland" Life Insurance Company,
Keizersgracht 245, Amsterdam.

Wolterbeek, L.,
Amsterdam.

ITALY.

Associazione Attuari,
Via Lauro, 7, Milan.

Benedetti, F., Comm., Ing.,
380, Corso, Rome.

Carmine, P., Comm., Ing.,
Depute au Parlement, President de l'Association Actuaires, Milan.

Ferrario, Richard, Chev.,
Banque Populaire, Milan.

Luzzati, Gioberti, Chev.,
Directeur General de l'Anonyme Accidents, Milan.

Merci, Luigi,
Sous-Actuaire de la Fondiaria, Florence.

Perozzo, Luigi, Comm., Ing.,
Conservateur des Hypotheques, Bergamo.

Sestilli, Batt. Gino (Vice-President of the Congress for Italy),
Attuario della Compagnia di Assicurazione di Milano.

Toja, Guido, Ing.,
Actuaire de La Fondiaria, Florence.

Tripodi, Joseph M.,
Messina.

JAPAN.

Hashimoto, Shigeyuki,
The Nippon Life Ass. Co., Ltd., Osaka.

NEW ZEALAND.

Fox, Morris,
Government Life Insurance Department, Wellington.

Galwey, C. E.,
Government Life Insurance Department, Wellington.

Leslie, G.,
Government Life Insurance Department, Wellington.

Muter, P.,
Government Life Insurance Department, Wellington.

Richardson, J. H., F.I.A.V.,
Secretary of the Government Life Insurance Department, Wellington.

NORWAY.

Foerden, Olaf,
Glitne Life Ass. Co., Christiania.

Hjorth, Jens,
Idun Life Ass. Co., Christiania.

Schöll, Oscar,
Rigsforsikringsanstalten, Christiania.

Thrane, Johannes,
Brage Life Ass. Co., Christiania.

RUSSIA.

Bounakow, A.,
Gr. Morskaja No. 37, St. Petersburg.

De Savitch, S. (Vice-President of the Congress for Russia),
Povarskoi per, 13, St. Petersburg.

Hamza, E.,
Gr. Morskaja No. 37, St. Petersburg.

Lefteiew, J. (Secretary of the Congress for Russia),
Gr. Morskaja, No. 37, St. Petersburg.

Nelioubow, N.,
Ulitza Glinka, No. 1, St. Petersburg.

Ostrogradski, M.
Ministry of the Interior, Insurance Section, St. Petersburg.

Penl, R.,
Gr. Morskaja No. 37, St. Petersburg.

Pokotiloff, A.,
Pensions Institution of State Railway, St. Petersburg.

Tarasoff, L.,
Yakor Insurance Company, Moscow.

Yermoloff, A.,
Delegate of Minister of Communication.

SOUTH AFRICA.

Gordon, Charles,
South African Mutual, Cape Town.

Marshall, William,
South African Mutual, Cape Town.

McGowan, James, B.A.,
Colonial Secretary's Office, Cape Town.

SPAIN.

Maluquer y Salvador, José,
Banco Vitalicio de Espana Compagnie d'Assurances sur la vie, Campomanes 10, Madrid.

SWEDEN.

Tiselius, Hans, Dr.,
Nordstjernan, Stockholm.

SWITZERLAND.

Ceresole, Dr. E.,
Berne.

De Cérenville, H.,
Directeur de la Suisse Société d'Assurances sur la vie, Lausanne.

Moser, Dr. Christian,
Rue de la Préfecture, 17, Berne.

Schaertlin, Dr. G. (Secretary of the Congress for Switzerland),
Société Suisse d'Ass. Générales sur la vie humaine, Zurich.

Wasels, W.,
Directeur de la Compagnie Suisse de Ré-assurances à Zurich.

UNITED STATES.

Alsop, David G.,
Assistant Actuary, Provident Life and Trust Company, Philadelphia, Pa.

Brinkerhoff, J. J.,
Actuary, Insurance Department, Springfield, Ills.

Cushman, E. W., Miss,
Actuary, Insurance Department, Boston, Mass.

De Boer, Joseph A.,
Actuary, National Life Insurance Company, Montpelier, Vt.

Fackler, David Parks,
Consulting Actuary, 35, Nassau Street, New York, N.Y.

Gore, John K.,
Actuary, Prudential Insurance Company, Newark, N.J.

Hann, Robert G.,
Second Assistant Actuary, Equitable Life Assurance Society of the United States, New York, N.Y.

Huntington, Robert W., Jun.,
Actuary, Connecticut General Life Insurance Company, Hartford, Conn.

Ireland, Oscar B.,
Actuary, Massachusetts Mutual Life Insurance Company, Springfield, Mass.

Kyle, Christopher,
New York Life Insurance Company, New York, N.Y.

Lee, James M.,
Actuary, Berkshire Life Insurance Company, Pittsfield, Mass.

Lunger, John B.,
Managing Actuary, New York Life Insurance Company, New York, N.Y.

Marshall, Elbert P.,
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ADDENDUM.

DR. KARUP'S PAPER ON GRADUATION.

Through a regretted oversight, Dr. Karup unfortunately had not an opportunity of seeing until too late a proof of the translation of his Paper on Graduation. He thinks that in various places errors have crept in, and that in others the translation could be improved. We therefore have pleasure in giving, exactly as he has supplied it, the following list of the alterations which he suggests.

Dr. Karup has added a few corrections of the German text.

EMENDANDA.

Page 79, line 2, *for* values founded on complicated observations, *read* complicated benefits.

Page 80, line 21, *for* a consideration, &c., *to* Higham, *read* neither the method of Woolhouse nor that of Higham takes any notice of the weights of the observations.

Page 80, 1. Osculatory Interpolations, line 3, *omit* for each successive one.

Page 80, line 7, *for* arrangement of the number of deaths, *read* true column of numbers living.

Page 80, line 2 from the bottom, *for* that, &c., *read* that according to the theory of probabilities the averaging of five different tables stands in close and natural connection with the interpolation adopted.

Page 81, line 17, *for* (the equal importance of each being understood), *read* (the observations being of equal weight).

Page 82, line 9, *for* variations, *read* breaks.

Page 82, line 12, *for* XXIII, *read* XXII.

Page 82, line 6 from the bottom, *for* considered of great value, *read* of great use here.

Page 84, line 12, *for* as well as, *read* or of, *and after* order *add* respectively.

Page 84, line 16, *for* As a corollary, &c., *read* For what follows.

Page 84, line 17, *for* of which we have made use, *read* used.

Page 84, line 20, *for* and indeed, &c., *to* available, *read* but, unlike the previous formulæ, is valid.

Page 84, 2. Interpolation, &c., line 1, *instead of* for the derivation of the mean, *read* of averaging.

Page 84, line 6 from the bottom, *for* those appertaining to the resulting, *read* the leading ones of.

Page 84, line 5 from the bottom, *for* resulting, *read* leading.

Page 85, line 5, *for* by this means *read* thus, *and for* contraction *read* diminution.

Page 86, line 16 from the bottom, *for* resulting, *read* leading.

Page 86, line 14 from the bottom, *for* averaged, *read* ascertained.

Page 86, line 6 from the bottom, *for* so that an inflection, *read* as an osculation.

Page 87, line 18, *for* value, *read* validity.

Page 87, line 21, *for* This follows, &c., *read* We get this curve by simply exchanging the last d^3 in (e) by zero.

Page 87, system (e), *Replace all* d^5 *by* ϵ^5 *and in the following first line of the text for* the last two d^5, *read* the abbreviation $\epsilon_p^5 = \frac{\Delta_p^5}{5^3}$ is used and the last two ϵ^5.

Page 87, line 3 from the bottom, *for* formula if it is preferred, &c., *read* formula we get, if we for the sake of simplicity assume, that the original system overlaps in both directions that to be derived from it.

Page 88, line 19, *for* as I reserve, *read* reserving to myself.

Page 88, line 15 from the bottom, *for* $\delta^{s-1}u_0$ first $\delta^s u_0$, to that, *read* $\delta^s u_0$ to $\delta^{s-1}u_1$, to the result.

Page 88, line 3 from the bottom, *for* by the, &c., *read* adhering strictly to the notation adopted the following system.

Page 89, system (h), in the second line, the last term on the left side of the equation is u_k, and in the third line the first term u_x.

Page 90, line 12, *for* as can, &c., *read* as evidently the order, in which the differentiations and summations are carried out, may be inverted.

Page 90, line 18, *for* to be found hereunder (k), *read* given in (h).

Page 90, line 21, *instead of* them, &c., *read* for them a second and for some purposes more convenient notation by putting.

Page 90, line 12 from the bottom, *for* higher than the last, *read* augmented.

Page 90, line 10 from the bottom, *for* earlier, *read* former.

Page 91, line 4, *for* latter, *read* formula thus arrived at.

Page 91, line 6, *for* This process, &c., *read* To illustrate the process we will at first apply it to Woolhouse's formula of interpolation.

Page 91, line 9, *for* as, *read* at.

Page 91, line 11, *for* third, *read* second.

Page 91, line 14 from the bottom, *for* And, &c., *read* And as the $\delta^2 u_4$ of the final graduated table, which for the sake of distinction may be called $\delta^2(u)_4$.

Page 91, line 12 from the bottom, *for* $\delta^2(u)_3$, *read* $\delta^2(u)_4$.

Page 91, line 8 from the bottom, *for* $x-3$, *read* $x-4$.

Page 91, last line, *for* (q), *read* (g).

Page 92, line 12, *for* we can, &c., *read* no simple constant or constant multiplied with x can be missing.

Page 92, line 13, *for* Let us, &c., *read* Noticing that the terms in brackets ( ) may be written thus: (formula)

or, by means of (h) and because $k=5$, thus:

$$-3S^3{}_{x-7}+7S^3{}_{x-6}-3S^3{}_{x-5}$$

and that, on the other hand, for $k=5$, or $\frac{k-1}{2}=2$, according to (l),

$$\sigma^3=S^3{}_{x-3.2}=S^3{}_{x-6},\ S^3{}_{x-7}=\sigma^3{}_{-1},\ S^3{}_{x-5}=\sigma_1{}^3,$$

we finally arrive at the formula

. . . . . (4)

Page 93, 4. THE RESULTS, &c , line 1, *for* it is, &c., *read* as a matter of course a mechanical formula consisting of many terms will generally yield better results than one involving only a few. But still the number of terms are not of the utmost importance ; much also, &c.

Page 93, 4. line 7, *for* which, &c., *read* which in its ascending and descending part very nearly resembles a straight line and runs as evenly and smoothly as possible through those points, where a turn is unavoidable, because as the calculation proceeds, each single observation receives in succession all the coefficients as factor, and thus an irregularity is less likely to be reproduced in the adjusted numbers, the more gradually it enters into the calculation and the more evenly it is distributed over a considerable space.

Page 93, line 6 from the bottom, *for* in tracing, &c., *read* in introducing the unadjusted quantities themselves in the formulæ (5) and (6).

Page 94, line 7, *read* the multiplication indicated in (5) by O. 0016 and the division in (6) by 5^4 respectively.

Page 94, line 12 from the bottom, *for* value, *read* weight.

Page 94, line 9 from the bottom, *for* of the abscissæ, &c., *read* approaches the abscissa so smoothly, that the latter appears as a tangent to it.

Page 95, line 17 from the bottom, *for* according to, *read* thus in.

Page 95, line 9 from the bottom, *for* conclusion, *read* end.

Page 95, line 6 from the bottom, *for* percentages of cases, &c., *read* the percentages of mortality, as here the weights of the observations are most easily taken into account.

Page 96, line 3, *for* lays, *read* presupposes.

Page 96, line 4, *for* recedes, *read* differs.

Page 96, line 8, *for* in them *and the rest of the sentence*, *read* of them to a certain extent graduates the intervening probabilities of death.

Page 96, line 10, *for* proportionately, *to* them, *read* treated in the same manner and averages introduced.

Page 96, line 22, *for* which, &c., *read* and has already been used by Sprague for a similar purpose.

Page 96, line 18 from the bottom, *for* number of deaths according to the calculations, *read* probable deaths.

Page 96, line 5 from the bottom, *for* variation, *read* deviation, *and for* death according to the calculation, *read* probable deaths.

Page 96, line 4 from the bottom, *for* whether, &c., *read* is—O. 55 or O. 61, according as the sign of the single deviations are considered or not. The result is in general of no value, as the probabilities of death at the younger ages lie near zero and the logarithm for zero itself becomes infinite (in the negative), so that any disturbances in the probabilities of these ages are greatly exaggerated in the logarithms.

Page 97, line 12, *for* complete, *read* direct.

Page 97, line 13, *for* although, *read* especially as.

Page 97, line 14, *for* arising from this process, *read* representing the error.

Page 97, line 17, *for* successive consecutive groups, *read* successive grouping.

Page 99, line 20, *for* u_1, *read* u.

Page 99, line 25, *for* and this, &c., *read* whilst Woolhouse's excels Higham's, and again the latter formula (5) in correctness.

Page 99, line 13 from the bottom, *for* is valuable in order, *read* may be applied.

Page 99, line 9 from the bottom, *omit* on one side.

Page 99, line 8, *for* on the other side, *read* that at the same time.

Page 100, line 9, *for* it concerns, &c., *read* it seems natural to base an improvement of the adjusted numbers on those deviations themselves as Sprague has already done in his applications of the graphic method. To avoid an arbitrary grouping and to proceed in the most simple manner, we divide, &c., *as in line* 13.

Page 100, line 26, *for* shall, &c., *read* by no means produces a new theoretical error, but partly removes that attaching to 9.

Page 100, line 29, *for* and further, &c., *read* and that accordingly the observations are without error, which would, &c.

Page 100, line 3 from the bottom, *for* evolved according to, *read* developed in terms of.

Page 101, line 7, *for* these hypotheses, &c , *read* the hypotheses introduced above, the amended values agree not only—as q does—to the 4th, but to still higher derivatives (in fact to the 6th) with the true probabilities of death.

Page 101, line 17, *for* within, &c., *read* the corresponding ages may vary from the first to the fifth within the interval.

Page 101, line 25, *for* a column, *read* sums.

Page 101, line 27, *for* and the corresponding, *read* denote the corresponding.

Page 101, line 28, *after* have, *insert* from.

Page 101, line 2 from the bottom, *for* abbreviate, *read* again form means of these quotients continually combining five of them in one average.

Page 102, line 3, *for* They are, &c., *read* The numbers at risk are however here generally so small, that a very minute correction becomes useless. Thus it seems to me the best course, to calculate a common correction δ for the first n and a similar one for the last n years, n being taken=10 or a little greater or less, just as the observations may require, and to base these corrections on all the material not made use of for the ordinary corrections, so that finally each observation has its due weight in the emendation of the first adjustment.

Page 104, line 6, *for* can increase, &c., *read* n, the number of ages used for δ, always can be chosen in such a manner, that the latter assumes a negative value.

Page 104, line 10, *for* are of, *read* show.

Page 104, line 17, *for* to have, *read* have.

Page 104, line 20, *for* this, *read* the.

Page 104, line 8 from the bottom, *for* a section out, *read* an average.

Page 104, line 3 from the bottom, *for* a starting point, *read* an average.

Page 105, line 4, *for* the increased material, *read* the part of the table thus supplemented.

Page 105, line 5, *for* by allowing, *read* by substituting the maximal or minimal value for all the preceding ones, if the curvature is not a natural one and corresponds to other observations.

Page 105, line 8, *instead of* next, *read* first of all.

Page 105, line 18, *for* number of deaths, *read* probabilities of death.

Page 105, line 22 from the bottom, *for* a similar, *read* such a.

Page 105, line 15 from the bottom, *for* although, *read* yet.

Page 106, line 1, *insert* also *between* which *and* takes.

Page 106, line 20, *for* a value, *read* an average.

Page 107, line 2, *for* it is not continuous, *read* in a large degree.

Page 107, line 3, *for* this by constructing, &c., *read* this, if we construct an artificial curve for the last mentioned ages and the preceding negative ones required in our formulæ, using hereby the original probabilities of the ages 6 to 15 or thereabout by forming averages, and interpolating by differences of the first and second order. The artificial values serve us in combination with the original observations for age 6 and upwards for a graduation in the usual manner, and the results thus obtained are finally augmented by the separately graduated differences between the observed and the artificial probabilities of the younger ages.

Page 107, line 12, *for* Further, *read* But.

Page 107, line 16, *omit* relatively to the numbers at the different ages within the group.

Page 107, line 18, *for* selected, &c., *to* those periods, *read* according to their importance, were grouped into smaller or longer periods of assurance, and within those periods grouped and graduated for single years of age.

Page 107, line 27, *for* had had some consideration, *read* is objectionable.

Page 107, line 31, *for* cases of, *read* percentages, *and for* this review, *read* the following table.

Page 107, line 35, *for* previously, &c., *read* interpolated ones of the single ages, follow, as we see, a regular law, and are by no means without significance. For the purposes aimed at by Chatham, his process may, however, have been sufficiently accurate.

Page 108, line 9, *omit* the use of the otherwise usual.

Page 108, line 10, *insert between* tables *and* for: generally made use of.

Page 108, line 16, *for* old English, *read* heavy, *and for* 100, *read* 99.

Page 109, line 12 from the bottom, *for* full of detail, *read* cumbrous.

BERICHTIGUNGEN DES DEUTSCHEN TEXTES.

S. 32, Zeile 12, lies "Leibrentenwerthe" für "Beobachtungswerthe."

S. 35, Zeile 20, lies XXII. anstatt XXIII.

S. 41, ist im System (*e*) sowie in der ersten Zeile des folgenden Textes überall d^5 durch ϵ^5 zu ersetzen und ausserdem muss in jener Zeile nach "worin" eingeschaltet werden "$\epsilon_p^5 = \frac{\Delta_p^5}{5^3}$ und."

S. 43, System (*h*): Das erste Glied in der Gleichung für S_x ist u_x.

S. 44, Zeile 4, lies (*h*) für (*k*).

S. 44, Zeile 9 von unten, lies "2te Differenzen" statt "3te."

S. 45, Zeile 6, 7 & 8, lies $\delta^2 u_4$ für $\delta^2 u_3$ und $\delta^2(u)_4$ für $\delta^2(u)_3$.

S. 45, Zeile 13, lies $x-4$ für $x-3$.

S. 74, Zeile 3, lies "fetter" anstatt "altenglischer."

S. 74, Zeile 4, lies 99 für 100.

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